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ABSTRACT

Reported are findings based on reviews of 40 longitudinal/intervention research projects, findings from a survey of 14 leading authorities in intervention research, and a proposal for developing a federal mechanism to translate intervention research projects into educational service programs for preschool children at risk of mental retardation. Findings from the research project review are given to indicate that intervention program participation yields positive results, and that the value varies according to characteristics of the program, of the child, and of the child's family or social setting. Results from the survey of authorities are discussed in relation to home-versus center-based programs, parents, staff considerations, program evaluation, research gaps, criteria for excellent programs, and issues concerning the federal role in research and program development. Proposed for federal effort to move successful program components into service is the system for educational research futures (SERF), a mechanism which combines a public-private partnership approach to product export, an incentive plan for federal agencies to identify promising programs, and a systematic surveillance and technical assistance activity to assure export and to assist potential consumers in export strategies. Included in appendixes are tables giving project information such as target population, program and evaluation characteristics, and dissemination readiness: a review of the Milwaukee Project (R. Heber), said to be well designed and innovative; and a list of over 400 publications on research projects or areas pertaining to early childhood. (MC)

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How can effective early intervention programs be delivered to potentially retarded children?

A Report

for the Office of the Secretary

of the

Department of Health, Education and Welfare

(Contract HEW-OS-72-205)

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from

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I

INTRODUCTION

This is a report on a study of educational intervention programs for children at risk of mental retardation. The study included a review of longitudinal research projects designed to develop successful intervention methods for improving performance in potentially retarded preschool aged children. Projects were selected for evaluation after reviewing the child development research literature and on nomination by knowledgeable people in the field. Special attention was paid not only to outcomes of exemplary projects but difficulties in the design, execution and conduct of such projects, particularly the problem of exporting effective and evaluated research products to field service programs.

Fourteen visible, competent and respected researchers in the field were visited on site and engaged in a comprehensive interview on matters related to educational intervention programs, especially development, evaluation, and export of successful intervention methods.

A review of federal mechanisms was undertaken by reviewing HEW for operations designed to maintain surveillance over, nurturance of, and assistance in dissemination, or to encourage exportation of promising or successful intervention programs or program components. Experts in the field were queried concerning support and assistance available for the export phase and also for ideas on how to develop or improve mechanisms at the federal level to move effective research products quickly into widespread service systems. Special federal agency reports on interagency coordination were also reviewed.

The following special activities were conducted in the course of the preparation of this report and are incorporated into the Appendix -

1. The establishment of criteria to screen research projects reviewed.

   (Appendix A)

2. The development of an information matrix to present data on projects reviewed.

   (Appendix B)

3. The development of an interview schedule for leading authority interviews.

   (Appendix C)

4. A special analysis of the Heber project.

   (Appendix D)

5. A survey of the literature and bibliography of references

   (Appendix E)

The study was accomplished by a team of five professionals in the child development and mental retardation research field. Reviews, interviews and evaluations were conducted between July and October, 1972.

The results of this study are presented here to assist in the matter of identifying effective intervention strategies for high risk children and to suggest ways to extend those programs that are effective to a larger population of children and families than is now apparently possible.

The report is divided into three main sections. The first deals with intervention research projects themselves. The second is a synthesis of information and recommendations from top researchers in the area. The third focuses on a proposal for a federal mechanism to improve the export activity of successful programs.

II

THE RESEARCH

A major portion of the task group effort was a review of the literature dealing with potentially retarded children. This review includes reported research, summaries of intervention research, surveys of reviews, special reports and papers developed on the topic over the last two years. This includes a recent paper by Bronfenbrenner (1972). A complete list of references is available in the Bibliography, Appendix E.

To screen the many projects to be reviewed by the task group a list of criteria was developed, Appendix A. A large group of projects was selected for special review and an information matrix, Appendix B, was developed to provide an easy and complete method for review and comparison between selected projects.

Additional information about intervention research projects, past, present and future, was obtained in special interviews with fourteen leading authorities in intervention research. The results of these interviews are reported in Section III.

The findings from the review of the research allow for the making of both general and specific statements with varying degrees of certitude. Both kinds of statements are presented in this section together with some cautions on interpretation of the findings and suggestions for future directions of research in this area. Problems related to the conduct of longitudinal intervention studies are also included.

A. Major findings from intervention research:

The results of the review of more than forty longitudinal intervention research programs for high risk children can be stated without much difficulty. The swift evaluation and export of the products of these programs is a more complex matter. Specific journal or report references are omitted to

provide an even narrative for non-technical readers. References are available in the Bibliography.

1. It has been demonstrated without much doubt that how a child is raised and the environment into which he is born have a major impact on what he will become. The complex condition of poverty, including poor diet, crowded conditions, disorganized families and an orientation towards failure, all contribute to the child's inability to realize the natural potential available from his inherited gene pool.

2. Factors such as race and sex do not appear to be related to the child's ability to profit from intervention programs.

3. The family's methods of establishing social roles leave little doubt that early family environment (parental language styles, attitudes toward achievement, parental involvement and concern for the child) have a significant impact on the child's development before he reaches his second birthday.

4. In situations where families are so disorganized that they cannot supply a supportive environment, an intensive external supportive environment may contribute to the child's development. Further, where sufficient access to the child is possible for intensive intervention activities, the child, who might be expected by virtue of his parent's low level of function to be mentally retarded, may be helped to circumvent that condition.

5. The effects of a stimulating or depriving environment appear to be most powerful in the early years of childhood when the most rapid growth and development take place. The primary locus of the child during these early years is the home. Therefore, home based intervention programs or one-to-one teacher-child ratio stimulation activities appear to be the most appropriate and effective during this period.

6. There is evidence that the effects of early intervention programs

for children are strengthened by the involvement of the child's parents.

7. It is only possible to describe the training conditions that handicap a child or lead to a child's success in general terms. The research programs are so new that only broad, global concepts are available. This does not mean that the broad conditions cannot eventually be delineated--but the specific factors in their relationship to performance are as yet unspecified.

8. The socio-economic status and entry IQ level of the child bear an uncertain relationship to the child's ability to profit from intervention. Design problems and the current state of the art in measurement render the effect of these factors difficult to determine.

9. Where access to children can be gained in the early years, preferably during the language emergent years (1 to 2 years of age), intervention programs will be more effective than those begun at later ages.

10. Between the ages of 4 and 6 years, a systematic organized program can contribute significantly to a child's social and intellectual development.

11. The effects of intervention programs appear to last only so long as the child remains in the intervention program. They appear to last longer in home training studies and "wash out" sooner in school programs.

12. Follow-up studies of children in intervention programs usually show that initial gains are no longer measurable. This is partially attributable to the fact that we cannot determine at this point whether it is due to program failure, to problems of measurement, to inadequate criterion measures or to the later interfering effects of other competing environments such as the home and school.

13. The quality and motivation of the staff are directly related to the success of the program and therefore are prime factors in determining the extent to which a program is exportable or replicable. In-service training and staff development can improve the level of function of the staff and

consequently the potential for success of the program.

Some findings are worthy of special note. They include:

1. In the successful programs, gains occur regardless of age of entry. The start age of children placed in intervention programs has varied across projects from those starting at a few months of age to a beginning age of 5 or 6 years. Results reported by at least one study have shown that children who enter learning-to-learn programs at age 4 make gains of nearly 20 IQ points which are maintained during the following 2 years. Children who enter at age 5 make smaller gains for each of the 2 years (9 points the first year and 7 points the second year). Although these results suggest differential gains as a function of age of entry, it does not answer the correlated question of whether gains would be sustained after the first year in the absence of such a program.

However, data from another project indicate that children who made gains in the project when they entered did not loose those gains as long as they remained in the program. The data do not strongly support any one year as the more preferred year to realize gains in intellectual growth.

Hence, the general conclusion must be that programs have been effective with all ages and one cannot specifically support the advantages for work at any one year versus another.

None of the studies reviewed gives support to a well defined critical period as a preference for preschool or early childhood intervention. Essentially, programs can be designed that will work effectively with a wide age range.

A comprehensive review of intervention programs in 1970 suggested that vulnerability to adverse influences at certain ages does not necessarily imply a correlated time when children are especially sensitive to treatment. This study supported the contention that, based on our current level of knowledge,

intervention can be justified throughout the period of early development and possibly beyond.

2. In successful programs gains occur regardless of sex. Studies have reported that girls have higher initial IQs than boys, while also observing that the sex of child was not related to gain scores. These findings are supported in general by other investigators, many of whom do not separate IQ scores by sex when reporting gains because of the lack of differences.

3. In successful programs gains occur regardless of race. Studies again report that although whites enter with higher initial IQ scores, race is not a significant variable in considering gain scores.

4. Differential gains in IQ scores occur as a function of the entering or initial IQ score, the program intensity, and the duration or length of time a child is in the program. In general, the lower the initial IQ the greater the gain in IQ in the intervention program. Again, the more intense the program, the greater the gain. In addition, the longer a child is in a program, the more likely he is to have a higher IQ gain. Finally, the interaction between intensity of program and duration in program contributes to differental gains. Some researchers, for example Bronfenbrenner, attribute the high initial gains to the phenonomon of regression to the mean and characterize them as being inflated for that reason.

5. In successful programs gains occur regardless of program approach but some programs appear to be better than others. Although almost all kinds of programs have shown gains in IQ scores, when specific comparisons are made among programs, some differences do occur. In general it should be stated that some programs work while others do not. In those that are successful, it is apparent that it is due to a higher degree of structure of program. In general, the more structure the greater the gain in IQ of participating children. A large scale comparison among programs has been conducted using four groups

than should be inferred as resulting from intervention activities.

7. There is increasing doubt as to the value of certain critical periods; therefore, the extent to which we can continue to emphasize only one period when we can expect positive outcomes of early intervention activities to occur is questionable.

8. There is a typical failure to individualize programs. That is, there is a homogeneity of treatment across heterogeneous groups whether it be social class, IQ level, sex, minority group, or other critical feature.

9. There are often significant cultural differences among minority and ethnic groups leading to differential reactions to intervention programs. This may lead to exaggerated responses from the children in either direction. Also, there are in many cases extreme value differences between subjects and their families and the project staff which may lead to inadequate or inappropriate intervention program components and results.

10. Program goals are often too narrow and constricted. There is more to development than IQ.

11. There are certain gains or responses to the intervention activities which are related to the motivation of the parents to encourage and assist their child to participate in the program. This parental support factor is not often considered as a part of what accounts for intervention programs' success.

12. There are severe logistical problems in connection with both the conduct of longitudinal studies and the development of exportable intervention program components.

13. There is an insufficient number of replications of special studies showing positive or hopeful results.

14. The cost of longitudinal studies has resulted in too few comprehensive studies, including health, education, social and parent program components.

In general, our review concludes that preschool educational intervention programs do have important and positive effects on the IQ of children. The results are often uneven and transient. There has not yet been sufficient research to warrant the selection of one set of program components as contributing to cognitive and social gains. Further, there has been little systematic effort to evaluate the alternatives for moving research product from the research phase to board service activities.

There are variations in the effects of intervention programs. The percent of time the child spends daily in the intervention program, the duration in number of months or years, the type of program, the start age of the child, parental supports, entering performance level of the child, all have a direct or combination effect on the outcome of intervention activities. There is a substantial gap between average practices in community educational settings, including the public schools, and exemplary research and development efforts based in both university and community settings. There has been insufficient attention given to the exportability of research products. There is a continuing and growing resistence among teachers and public school administrators to innovative educational practices.

It is still too early to tell the extent to which we should be installing some specific intervention programs broadly throughout the country in an effort to improve children's function. Research efforts thus far have been insufficiently comprehensive in their approach and too poorly supported both in terms of financial resources and the portion of the child development research establishment willing or able to undertake longitudinal/intervention studies that are well designed and well staffed.

There is an appalling lack of a central governance and nurturance system at the national level which would help guide and orchestrate the several ..dinal/intervention research activities being conducted at this time.

In most respects the area is actually understudied given the research program results obtained thus far and their promise for being instrumental, especially with very young children with moderately low IQ scores.

C. Problems in conducting longitudinal/intervention studies:

1. Inadequate control groups: Given the problem of adequately describing the population, it rarely becomes possible to determine the adequacy of the control group. Rarely are children selected from the same population pool and randomly assigned to treatment groups.

2. Treatment drift: Once an evaluation model is adopted, decisions are made to change the program according to information gathered. This is a highly acceptable practice in the remediation of children's deficiencies. However as this occurs, the intervention program is no longer being conducted as originally described. As a longitudinal study refines its procedures, new strategies are invented, thus markedly changing the original procedures. Frequently the change is not described in the write-up.

3. Press to do well: Most innovators are funded to demonstrate the effectiveness of a given idea or program. They are expected to succeed. Given the press to succeed, the program is constantly revised and modified based on pupil responses. Similar to the problem of treatment drift above, the program in operation often bears little resemblance to the written proposal.

4. Teacher effect: Evidence indicates that the teacher, not the program, may be the crucial variable in creating change. It has been indicated that the method or program adopted interacts with the stylistic treatment of the teacher. The teacher factors that are relative to the change are highly idiosyncratic and difficult to control. One research has identified four major clusters of teachers based on control and expressions of warmth. Another researcher has pursued other sets of personality factors of the teacher that influence pupil change. Yet another has identified planning and supervision

as more important to the program than the curriculum components themselves. How you do something may be more important than what you do.

5. Teachers reach criterion performance: Frequently a program is developed by an innovator who then hires a staff to conduct the program. In the experience of the authors, it frequently takes as long as two to three years before the staff can conduct the program as originally conceived. Massive in-service efforts are needed in all intervention programs with frequent supervision and evaluation of teacher performance. Some personnel will not be able to reach criterion performance and will need to be replaced.

6. Ethics with human subjects: The innovator, in dealing with human subjects, cannot manipulate the research environment unless he is sure he will not damage the child in any way. This ethical "restriction" is necessary in working with human subjects and limits the degree of manipulation the innovator can apply. For example, does one remove children from their mothers in order to work intensively with them?

7. Continuity of staffing: As with life-span research projects, it is difficult for a principal investigator to commit himself over his own life span. If the principal investigator leaves the project, there may be a shift in focus or interest when a new principal investigator takes over. There is also staff turnover, change in staff training or staff development activities, especially in university-based programs where graduate students are used extensively.

8. Testing procedures: Again, as with life span research projects, testing schedules, instrument revision, and discontinuity and low correlation between tests brought into the long-term testing activity contribute problems in conduct of the project as well as difficulties in data interpretation.

9. Data processing: Masses of data can accumulate in longitudinal studies which can present both problems of data processing and difficulties in

decision-making as to which data to process. This is especially problematic for the new researcher in the intervention field.

10. Environmental changes: Children in longitudinal studies are often influenced by major shifts in the community or neighborhood environment which may then have a direct effect on the outcome of the intervention activities. Shifts in cultural mores, social attitudes and values may have similar effects.

11. Attrition: The mobility of the American family is well known. While techniques are available to adjust to subject attrition, it is an expensive process and often requires resources not provided in the intervention programs. It is essential that large subject samples be acquired and maintained over a long period of time in order to circumvent the problems caused by subject attrition.

D. Problems in interpreting results of longitudinal studies:

1. Nature of the population: In working with high risk youngsters, the set of variables associated is multiple and often incomparable. For example, the construct "culturally deprived", used by different research workers, includes: income level, racial differences, inadequate diet, protein deficiency, punitive child-rearing practices, low language stimulation, isolation, oppression, high disease rates, alcoholism, and so on. It often is assumed that all of these factors contribute the same influence. Clearly, the state of the art of knowledge of how to deal effectively with high risk populations is not developed to the point at which the population of children can be described with the precision needed to replicate a study. In addition, children who live in poverty are still found in markedly different environments--for example, contrast the immigrant worker's child with the child of the inner city dweller or the sharecropper. The life experiences are markedly different.

2. Problems of program description: One of the major problems in interpreting intervention programs is that often the program descriptions are not

sufficiently detailed to understand what it was that the innovator did. Global terms are frequently used that make it difficult either to replicate or to isolate the variables that were related to the treatment. For example, a study of adopted versus non-adopted children may not adequately define the nature of the treatment; i.e., what happened in the homes that did not happen in the orphanages to cause the results? Longitudinal intervention studies rarely describe all of the procedures by which they undertook their program. On the other hand, it is frequently impossible to describe exactly what was done. A major intervention program may have components that deal with classroom experiences, parent training, improved nutrition, medical screening, and vision and hearing tests. Ascribing treatment success to any one variable is a tenuous procedure.

3. Failure to develop appropriate instruments: One of the major difficulties in conducting studies with children is specifying exactly what evaluation the innovator will be able to perform following the intervention. Many programs specify IQ scores as their end objective. However, IQ scores are unreliable and invalid for most minority group children, and, in addition, IQ refers more to traits related to school performance than to cognitive functioning. The appeal of the behaviorally oriented programs is their tendency to limit their goals to observable behaviors. However, the weakness of this approach is that one is still left with the problem of defining the "internal processes" of the child and frequently minor and sometimes irrelevant behaviors.

Global measures of intelligence and achievement are inappropriate measures for program impact. Intelligence measures assume common cultural experiences, equal opportunity to learn and equal motivation to do well on the tests. For most minority group children these assumptions cannot be met.

Achievement tests contain many items aimed at reasoning ability rather than

the skill under treatment. For example, as much as fifty percent of the items on elementary school reading tests are inference problems rather than reading problems. Reading is learning a set of abstract arbitrary symbols and relating them to another set of symbols that are spoken--that is speech. Children can relate words to print and learn that the printed word stands for the spoken word or for objects, but unless long trials of memorization, drill and practice techniques are used, children do not understand the abstraction of graphemics until ten to twelve years of age. Thus, many reading tests are misnamed; they would be more appropriately titled "Reasoning from reading" tests.

4. Intuitive appeal of gains scores: In spite of the work of Cronbach, Thorndike and others that demonstrated that gain scores are unreliable, statistically indefensible and subject to great misinterpretation for individuals or groups, there still exists great pressure for programs to demonstrate effectiveness by measuring gains on the same instrument.

Measurement should not concern itself with change as measured by gain scores but by performance of the desired behavior that defines the criterion performance. Criterion referenced tests are difficult to construct unless the behaviors are readily observable. For example, it is easier to specify that as a result of the program children will be able to count to ten or identify six primary colors than to specify that they will develop a positive self-concept and attitude towards others.

5. Inadequate or naive theory of human behavior: Many longitudinal studies fail to conceptualize the nature of how humans learn and the processes of development. The results of these studies can easily be misinterpreted and attribute their results to dubious reasoning. Recent findings in developmental theory and learning have been massive. The human organism is an impressive information processor from the moment of birth. However, many still fail to

recognize the infant's capacity to process information and continue to perceive the child as a passive receptor of information--thereby attributing to their training procedures more power than is likely to be present. Equally, the innovator who works with the handicapped child frequently views all the child's lacks in terms of and as a function of his handicap without taking into account his age and the normal stages of growth and development.

6. Retrospective data, time and cost: Most retrospective data collected from teachers and parents bear little resemblance to the child's actual functioning. The unreliability of these data makes longitudinal studies all the more necessary. However, longitudinal studies take time and careful record keeping. It may be twenty years before the effects of the intervention program can be fully measured. Longitudinal studies are costly ventures, although they may be the only means by which some questions can be answered.

7. Delayed effects: Rarely do longitudinal studies measure delayed effects of their treatment. For example, does the program introduced in kindergarten have any measurable effects on adolescent behavior? Rarely do school programs measure adult attitudes, voting habits, reading habits or other goals which were part of the school curriculum.

8. Narrow focus of the program: Some longitudinal studies become so specialized and deal with such a narrow population that they cannot be replicated. For example, a program that provides one-to-one teacher/pupil ratio for six hours a day, six days a week, with supporting psychological, medical, and speech staff would be difficult to find in a regular school.

9. Sample problems: The size of the sample and the representativeness of the sample must be taken more seriously into account. Samples have generally been too small to allow for much generalization. The results of a program that also limits itself to a unique population have little generalizability to other populations of high risk children. Further, shrinkage of

already small samples occurs over time and contributes to the lack of follow-up results or effects.

10. The effect of continued assessment or observation: The effects of continuous testing in long term studies, including observer effects, can have an equal or perhaps greater effect on performance than some or all of the program components. In many programs the continuous assessment and the intervention curriculum are confounded in such a way as to prevent attribution of which contributed to change. In some cases continuous assessment of control groups may contribute to equal change as compared with the experimental group, therefore leading to an inability to measure the effect of the intervention program itself. In some cases, researchers suggest that continuous assessment is equivalent to minimal intervention. Intervention studies are no less immune to the Hawthorne effect than any other study.

E. Problems of data interpretation in longitudinal studies:

1. Appeal of the experimental model: Research in psychology and education have been greatly influenced by research success in the physical sciences. Basically, the physical sciences' "scientific method" or experimental research model includes observation of events, the generation of a theory from these observations, the formulation of a set of hypotheses deduced from the theory and, finally, the test of the hypotheses by manipulation and control of the variables. The model provides an excellent tool for the formulation of basic laws of physics and chemistry and as a tool for invention. Its usefulness depends upon the isolation of single variables and the freedom to manipulate the environment.

Experimental research has been used with some success in education when the events can be directly observed. The major problem in conducting empirical research with humans is that much of human behavior is unobservable (thinking, short-term memory processes) and inferences must be made from performances of

an act to some hypothetical trait that exists "within" the human. Thus, psychology is concerned with signs and samples of behavior from which traits can be inferred and has developed a variety of theories and constructs to describe traits in man that cannot be observed directly. The research worker in psychology is dependent upon the power of his reasoning in developing a nomonological net (a set of logical relationships) that links observed behavior to inferred traits. The fruits of these reasonings have produced theories as divergent as those of Freud and Skinner.

Laymen and scientists in the physical and natural sciences have historically been critical of psychologists'--and educators'--"lack of rigor" in their research efforts. In response to these criticisms, it would appear that two lines of major development occurred. Psychologists have attempted to use the empirical model to conduct research, usually with minor behaviors on easily manipulated variables. Whereas the research rigor improved psychological understandings, it did not make major advances in psychological theory.

Secondly, psychologists have attempted to avoid making inferences about internal states and deal only with direct observable behavior, as Skinner and his followers suggested. As rigorous as these studies have been in design, they still have contributed little general understanding to our notions of human behavior. It would appear that the greatest contributions have been made by those who dealt with small numbers of subjects and who made "strong inferences" from thses observations (Piaget, Freud, Erickson).

As mentioned earlier, longitudinal studies such as the Berkeley Growth Study, the Iowa Study, and Terman's Gifted Child Study have added much to our information about what happens to growing humans; however, these researchers substantiated their findings by frequency counts, not by manipulation of events as empirical research.

The attractiveness of the empirical model is still strong even though it

can rarely be applied to human subjects. In research studies which seek to influence change, rarely can the research worker attribute change to a single variable. For example, a preschool intervention study providing a breakfast program, parent education component, medical screening, highly trained teachers and innovative curriculum materials is in a dilemma trying to attribute success to any single variable. The best that can be done is to describe carefully all components and speculate as to the contributing variables that made a difference. Only from such studies, however, will the generation of hypotheses emerge that will lead to empirical studies; rarely will they come from studies which fully manipulate the events due to ethical restraints. Clearly, we can observe nutritional deficits among the starving people of the world and know enough from our own logic to avoid having to engage in empirical research in all areas.

In spite of problems, longitudinal research in intervention, including observation and case studies, is the method of choice. Only through this research strategy will be able to answer the questions we are pursuing.

2. IQ as a measure: While the IQ is still the predominant measure, it is important to note that evidence is substantial to support the contention that IQ is not necessarily constant, but can vary as a function of one's experiences. The viewpoint on the constancy of IQ scores has changed from the beliefs and the debates during the 1930s and '40s to a consensus during the '50s and '60s that IQ is not constant and that environmental manipulation can have an effect on this narrow but useful description of behavior and criterion for performance level.

Preschool intervention programs have looked to gains made on IQ tests as one measure of the effectiveness of their procedures. Attention during the '60s focused on this issue specifically as the environments of the culturally disadvantaged and potentially retarded received national attention.

The use of IQ scores necessitates the review of two well referenced phenomena with regard to IQ tests: (1) IQ scores vary as a function of race and socio-economic background, and (2) for some social classes, measured IQ scores from preschool to adolescence show a decline in the absence of specific intervention programs.

Almost all evidence supports a lack of differences in IQ during infancy or in the very early preschool years. After this point, major differences are shown as a function of race and socio-economic background. Hence several statements, supported by later findings in actual intervention programs, show that differences in initial IQ scores vary as a function of age of entry into the intervention program, social class, and race of the children and their families.

F. Special review:

In many ways this review and report were initiated by the results of a project in Milwaukee, at the Infant Education Center, directed by Dr. Rick Heber, and supported by SRS. There are several reasons why this research is of interest and value and a special report and analysis has been prepared (Appendix D).

First, the longitudinal study is of high intensity, long duration, deals with children whose mothers have measured borderline intelligence, and seeks to measure a broader band of behaviors than simply IQ.

Second, IQ and other criterion measures show phenomenal gains over the five years of the project thus far.

Third, the project is directed primarily at answering a research question: Can intensive environmental manipulation overcome expected lower levels of performance predicted by inherited abilities? The answer seems to be yes, although several well reasoned criticisms of the design and analysis of this study have emerged. While the sample is very small, gains in IQ remain

in the children. The mothers, involved in a correlated vocational training effort, are demonstrating an ability to make a productive adaption to the community.

Fourth, the cost of the study (said to be about $10,000 per child) is leading many to deride the project as impractical, overlooking the fact that the project was not designed to be a demonstration of feasible intervention. It does not claim to be low-cost and furthermore did not set out to be. Project personnel, including the director, fear that the basic thrust, the environmental versus inherited potential question, will be lost in the maze of well meaning people seeking effective intervention methods for immediate export and use.

The Milwaukee Project is a good example of the basic problem of export for longitudinal studies. The capacity for product export must be present from the beginning of the project. This requires money, manpower and management resources from the start, including the capacity to train technical assistants for deployment to potential user systems when the product is ready. To engage in this complex enterprise, while focusing on pursuit of a basic research question, is neither possible nor present in any intervention study reviewed by this task group. Therein lies the problem of the research product "log jam". Projects like Heber's are scattered across the country today alternately crying for help to field test and export their wares and hiding out from pressures from both grantor agencies and needy consumers because they have no way to engage in export. The result is irritated researchers, frustrated consumers, anxious agency personnel, and curious federal administrators all interested in children but not knowing how to move. A biomedical analogy might be useful here. Enders, Salk, Sabin and others made the basic research contribution of isolating the polio virus necessary to proceed to the problem of distributing the vaccine within an effective

immunization delivery system. The cost of isolating the virus did not matter. Neither was Enders expected to deliver the vaccine. However, the system and resources necessary to deliver it were developed, funded and used because we set the priority necessary to do it. Once the technology is present, we need resource development, the ability to mass large numbers of people from many disciplines to work on the problem, and the ability to weather early failures, critical public opinion, and shifts in national priorities. The best researchers are also needed to stay on task while responding to public demands for information and demonstrations of what is being done and how things are going. These demands include cost and social benefits available now and in the future to reassure us that if the long range goals fail, then at least something good will have come of the effort along the way.

The space program analogy is obvious except that we have only a limited theory and technology base to see the intervention research effort as being anything other than the earliest phase of trying "to get off the pad". Limited resources and wavering moral support threaten these early activities and a plan needs to be developed to assist the programs in their attempts to fly.

If Heber's project does nothing more, it has helped by demonstrating the vast difference between a research project and a research-demonstration-development-dissemination project. The "compleat project" needs all of these features to move the product into use. Without all of them the intervention project fails to pass the ultimate test of whether its work holds up in the field in widespread use in a variety of settings by other implementers.

G. Cost and social benefits:

The majority of researchers interviewed and most people in the intervention field hold that intervention programs have short and long-term beneficial effects, both social and economic. However, it must be pointed out that there

is very little data to support those contentions and no significant studies are being conducted to evaluate the social and cost benefits of intervention with preschool potentially retarded children.

Some projects point to clear but subjective evidence of increased family cohesiveness, integrity and educational benefits from the diffusion of program gains from participating children to brothers, sisters, parents and neighbors. The diffusion effect is still an elusive concept and difficult to measure. Typical statements from the field are that positive social effects accrue to the child beyond intellectual gains, that most parents improve socially, that the community social benefits are great and that the national impact of widespread programs, aimed at preventing most of mental retardation, would produce phenomenal social benefits not unrelated to great savings in the costs of alternative programs for "untreated" children such as residential care, welfare, unemployment, delinquency, illiteracy and public health hazards.

Almost exclusively programs have focused on individual gains in children along the dimensions of intelligence, language or motor skills. Few programs have given serious consideration to social benefits or cost benefits assessment. Most are interested or concerned with it but they neither require it for a demonstration of the effectiveness of their program nor demand it in order to judge their intervention research successful. They are centering primarily on the problem of increasing intellectual ability in the face of heavy environmental, and sometimes genetic, odds.

The parameters of social benefits have not been delineated. Methodologies and measures are not available to pursue social benefit studies. Intervention researchers are not usually trained or skilled in the areas required to pursue social or cost benefits questions. Efforts should be made to remedy this situation and mount special studies to settle the question.

However, intervention research projects should not be made to include social or cost benefits evaluations in order to pursue their work. Nor should successful intervention methods be deemed unsuccessful simply because there are no pronounced measurable social or cost benefits.

Social benefits were seen as falling into at least eight categories:

1. Immediate versus long range or delayed.
2. Specified versus unspecified.
3. Measures versus unmeasured.
4. Expensive versus free.
5. Planned versus unanticipated.
6. Intraprogram versus external.
7. Subject or child related versus child unrelated.
8. Staff related versus staff independent.

The most obvious social benefits at this stage appear to be immediate and both child and staff related, therefore program specific. A child who learns to listen, read, adjust, walk, cooperate or play registers immediate social gains for himself and many others including children and staff.

The greatest need for research in this domain is in long range benefits. Measuring both planned and unplanned long term effects (on the order of ten years) seems at this point a serious problem. No one is even planning such a study! Reliable and valid measures seem unavailable. Design and analysis problems are difficult enough in the current intervention programs, but the problem and the question must be attacked as part of the overall question of feasibility of export and broad diffusion of successful program and training components. They are crucial for public policy as well.

Cost effectiveness, cost benefit and cost utility are not foreign terms to educational intervention research. However, the necessary information base, cost analysis techniques, program unit costs and methodology for

conducting short, intermediate or long range benefits studies are simply not available to intervention researchers. In addition, the cost and value of education have typically been measured by the amount of input, e.g., average per child costs. States actually compare their relative standing by the amount of input rather than measurable output. Most economists shudder at the thought.

Because program planning and program evaluation techniques are seldom used to develop and conduct intervention research, there is usually little data on resources and constraints, alternative strategies, adjustment of objectives, or selection of measurable goals and objectives. This condition hampers efforts to conduct cost benefit analyses or even to make a clear statement of total cost per child of a successful intervention program.

Any effort to assist program export, implementation and multiplier activity must include pre-program planning for evaluation and both technical assistance to the program on program evaluation and an external process and product evaluation of the purportedly successful intervention program. Program planning and evaluation models are available for use by intervention programs now. Research training programs should incorporate such techniques into their curricula to assure us of a trained researcher corps in the future.

III

INFORMATION FROM LEADING EARLY INTERVENTION AUTHORITIES

In addition to an extensive review of the early intervention literature, the members of the task group that prepared this report decided to go beyond their own number and interview authorities in the early intervention field in order to insure the latest and broadest coverage of the major issues. This strategy was considered desirable to supplement published sources because of the substantial lag in time for material to be published and because some of the key issues are not typically covered in the literature.

Task group members each nominated between ten and twenty individuals whom they saw as key people in various aspects of early intervention. A tabulation was made, and fourteen individuals were selected to form the panel of leaders to be visited at their program sites and interviewed by task group members.

The interview process spanned the months July through October, 1972. The questionnaire and interview schedule (both included in appendices) were constructed especially for this project and formed the nucleus of the extensive and far ranging interviews.

Task group members also contributed material by filling out the questionnaire, reacting to the interview schedule, and sharing their own experiences in intervention research.

Results of Interview Phase

The panel of early intervention authorities included the following individuals: Dr. Earl Schaefer, University of North Carolina; Dr. Susan Gray, George Peabody College; Dr. Carl Bereiter, Ontario Institute of Studies in Education; Dr. Bettye Caldwell, University of Arkansas; Dr. Rick Heber, University of Wisconsin; Dr. Dorothy Huntington, Children's Hospital, Washington, D.C.;

Dr. Merle Karnes, University of Illinois; Dr. Ronald Lally, Syracuse University; Dr. Phyllis Levenstein, Family Service Associate of NASSAU County; Dr. William Meyer, Syracuse University; Dr. Glen Nimnicht, Far West Lab for Educational Research and Development; Dr. Howard Spicker, Indiana University; Dr. Herbert Sprigle, University of Florida; Dr. David Weikart, Hi/Scope Educational Research Foundation.

Report of the distillation of the interview material covers the following topics: (1) intervention program essentials, (2) the role of parents, (3) staff considerations, (4) evaluation of intervention programs, (5) child and family characteristics and program effects, (6) program lacks and weaknesses, (7) research gaps, (8) criteria for excellent programs, (9) general intervention issues, and (10) issues concerning the role of the federal government.

1. Program Essentials

Early intervention programs may take place in the homes of children or in intervention centers. These types, based on location, are dealt with separately.

a. Home-based programs. Particularly suited to young children (below 4 years of age) from a wide variety of backgrounds, home-based programs show great promise in influencing children's development. As with other intervention programs it is suggested that R & D include comparisons of various program elements and variations to establish easily transmittable and cost-effective programs. In general this approach has not been found to be costly, averaging far less than one-quarter the expense of ordinary center programs.

The suggested target of most home-based programs is the parent, usually the mother, within the context of the family. Establishment of rapport with the parents is essential. Programs are often fitted to the needs of individual families and are designed to capitalize on the particular strengths

of the family. A major goal is to develop the parents as teachers of their own children (they are, after all, the child's first teachers), enhancing their self-esteem, independence, options, and general skills.

Typically paraprofessionals visit the homes on a regular basis, once or twice a week, for one or two years. While the complexity of the program may vary, there is generally a consistent theory or framework which guides the home visitors to help parents develop their children's language, general intelligence, social skills, and emotional expression. Materials, either commercially available or home-made, are quite important and are used in a systematic and sequenced fashion. Often materials are left in the homes permanently. It is hoped that parents will develop more effective teaching styles and be able to channel their children's behavior into constructive and healthy activities.

Essential elements of effective program operation include: provision for initial and ongoing staff training; feedback and quality control systems; means of developing and preserving staff morale; and mechanisms for supporting the parents and sustaining program goals.

b. Center-based programs. Center-based programs are typically provided for the older preschooler, however, there are some excellent center programs for infants and toddlers. Diversity of opinion among panel members arises on several center-based issues--how early to intervene, how long to intervene, necessary staff credentials, whether the program should be predominantly child or teacher initiated, the use of open vs. more structured educational strategies, homogeneity vs. heterogeneity of children served, specificity vs. globality of goals. The panel members are of remarkably similar mind on most other issues in the field.

Most experts take a process rather than product view. They opt for a balanced social-emotional-cognitive approach with such specific child outcome

objectives in mind as interpersonal trust, choice, alertness to surroundings, breadth of experience, music and art ability, language, reading, mathematics, problem solving, learning to learn, motivation to achieve, general intellectual skills and processes, classification, attitudes toward learning and medical-biological well-being.

The specifics of programs generally agreed upon include: assessment of children's needs and strengths, fitting the program to individual children, techniques for individualizing instruction, provision of an adequate emotional climate ("good home" atmosphere), provision of transportation and comprehensive medical and social services, the importance of a theory or consistent framework guiding program operation, small teacher-pupil ratios (1-1 to 1-6), respect of the child's integrity, restraint from imposing adult perspectives on the child prematurely, a meaningful spatial arrangement and utilization of time schedule, the use and development of stimulating and age-appropriate educational materials, regular planning and evaluation sessions, adequate feedback and evaluation procedures, concern for behavior beyond the classroom, appropriate behavior management techniques, clear specification goals and strategies, teacher accountability, and the desirability of systems to support children and sustain program gains. This long list adds up to the picture of a carefully planned, well implemented, and meaningfully evaluated set of systems within which teacher and children engage in human and growth enhancing transactions--no simple thing to develop and maintain.

With respect to program operation and delivery, again the panel evidenced agreement. Key service delivery features involve: need for training manuals and materials, a developed curriculum, quality control mechanisms, highly competent staff, effective staff training, high staff motivation and morale, the importance of a proper staff-program match in terms of beliefs,

philosophy, etc., staff supervision, and the crucial importance of predictable funding.

2. Role of Parents

In addition to parents' role as the typical target of home-based programs, nearly all the panel members also mention the importance of parents in other ways: either in terms of their involvement and participation in program operation and decision making, or in terms of their role as advisors and participants in parent education programs to help reinforce and sustain program effects. Some feel that parental involvement is relatively unimportant if program quality is high. Several mention diffusion effects, where children in the family other than the target child and even children outside the target home in the adjacent community are positively influenced through the parents.

Parents are seen as being important for maintaining their children's health and giving them good nutrition, assuring their attendance in programs, teaching their children in the course of their normal daily home routine, making materials which help their children learn, teaching other parents to work with children, and assisting in the operation of schools with consequent benefit to their children. Some caution us not to underestimate the abilities of lower income parents and point out that effective parents from any economic background can obviate the need for costly institutional early intervention arrangements.

There is consensus that it is difficult to achieve positive parent outcomes. Some of early intervention's more glaring gaps are in this area, especially when it comes to evaluation techniques. There is confessed difficulty in measuring parental self-esteem, locus of control, life-style changes, interactions with children, transfer of program skills--in short the general effects of parent-oriented programs. Some feel we do not know

what effective parenting is, i.e., specifically what parental behaviors lead to the development of competence in their children. Several maintain that it is extremely difficult to alter parent-teaching styles and skills, especially in disorganized families. It is difficult also to get some parents to have fun teaching their children, to interact verbally with their children, to teach their children as a part of everyday activity. Further difficulties arise in trying to get fathers involved, keep some parents above survival level in the face of life's hardships, and sustain the positive effects of intervention programs.

3. Staff Considerations

Almost without exception the panel of experts sees effective staff functioning as the sine qua non of program excellence. Even in the one case where staff quality is not seen as crucial, there are still fairly important qualifications stated as bare minima.

The following are desirable staff characteristics as suggested by the panel: flexibility (most often mentioned), intelligence and verbal ability, believability, strong mindedness, limited sentimentality, self confidence, tolerance of ambiguity, warmth, ability to mind own business beyond professional role, persistence, patience, diligence, ability to function as team member, reliability, sense of humor, enjoyment of children, and predictability--a formidable list to say the least.

While the panel members are not unwilling to state high expectations of staff who work in intervention programs, they are not naive enough to believe that these characteristics are easy to find or develop. Behaviors specifically mentioned as difficult to find or attain include: sensitivity to individual children, interpersonal skill, high and consistent levels of motivation, ability to understand program rationale, an experimental, data oriented attitude, consistency in responding to children, ability to let

children take the lead in certain situations, combining action and language in working with parents and children, ability to express joy and praise spontaneously, ability of home visitors to focus on mother not baby, ability to respond to affective needs of children, ability to listen-observe-respond, and intellectual curiosity. In selecting community paraprofessionals, a particular difficulty arises in getting them to accept program values which may be in conflict with their usual approach to life. Desired behaviors here include acceptance of child behavior, a nonpunitive approach, tolerance for "fussing" of babies, and an expanding rather than restricting approach to children. On the other hand, a major problem in working with professionally trained staff is their typical resistance to change.

To maximize effective staff functioning the panel proposes a consistent pattern of activities including: some form of initial preservice orientation or workshop; use of a consistent instructional model or framework; continuing inservice training, supervision, and feedback; building a self-educational process based on daily planning and evaluation; heavy reliance on a practical, "hands on" approach; use of multi-media techniques; and urging attendance in formal courses. The importance of adequate supervision cannot be overemphasized. Several panel members caution about the significant length of time necessary for training staff, especially in public school settings.

4. Evaluation of Programs

With the possible exception of the issue of federal response, evaluation is the issue about which the panel has the most to say. In general, the authorities can specify what they feel to be aspects of ideal evaluation; however, there is a general feeling that evaluation technology is woefully inadequate to assess program subtleties. This is clearly an area where many have been burned and there is some bitterness, especially where

federal-level evaluations are concerned.

It is fair to say that most of the authorities on the panel, although not all, feel that the "bad press" that early intervention has gotten in some quarters is attributable to the public's (professionals included) willingness to accept results based on studies which were poorly designed and which utilized inadequate instrumentation. (Actually many on the panel would probably apply the same criticism to their own work.) It is difficult to measure young children and their parents operating in natural settings. The panel members felt that if we wish to make substantial progress in early intervention, we must spend more money on and be more willing to engage in the somewhat inglorious activity of developing adequate evaluation strategies and instrumentation.

There are several controversial issues in the area of evaluation of early intervention programs. One is the validity of using external evaluators. One camp maintains that only in this way can objective and interprogram evaluation be carried out; the other camp feels that external evaluators rarely appreciate the subtleties of local programs and therefore produce inappropriate and inadequate evaluation data. Another controversy hinges on the use of the experimental method--the use of experimental-control/pre-post test designs. Some maintain that only by utilizing such a strategy can public and unambiguous evaluative data be produced, while others feel that the really important question is "what kinds of programs for what kinds of children?", a question which defies traditional experimental analyses. This question requires on-line, formative evaluation which attempts to track the progress of individual children through a program. However, this kind of evaluation technology has not been well developed and it is unclear as to how policy makers can decide on program implementation based on these kinds of data. A final evaluation controversy revolves around

the use of standardized tests. Some claim that only by the use of these carefully developed and well known instruments can we compare different programs based on objective data. Others maintain that standardized tests are so far from measuring intended program objectives that their objectivity is outweighed by their irrelevance. Here the chief culprit is the standardized IQ test, followed closely by the standardized achievement test.

The panel's consensus about adequate evaluation procedures involves at the most general level (a) cognitive, social, and emotional evaluation of (b) both children and parents using (c) both norm and criterion referenced evaluation of (d) both immediate and long term effects. Further desirable features include: replications and field tests, component or element analyses and related cost-effectiveness procedures, multi-variate approaches, both formative and summative evaluation, theory-based instruments, focus on the process of learning, the utility of randomization in assigning subjects to groups, and the utility of selecting larger groups of control subjects to guard against the problem of attrition.

It is in describing the gaps, lacks, weaknesses, and problems in evaluation that the panel is most eloquent. Attrition of subjects in longitudinal studies is considered a key issue.

One researcher offered an important contention related to the phenomenon of the disappearing gain scores with the passage of time after children have moved out of preschool intervention programs.

The researcher maintained that we do not know if preschool treatments have long term effects because sample sizes have been too small to allow a reasonable chance for genuine long term effects to reveal themselves as statistically significant. Attrition of subjects over the intervening years between the intervention program and follow-up assessment leave groups that are too small to test whether the original effect is still there. The

larger problem than simply the loss of children over time has to do with the inevitable loss of predictive power with the passage of time. Preschool reading readiness programs, for example, might only account for a small percentage of the variance in reading achievement at the third grade level, not because the effects of the preschool program had washed out but because there is a diminishing correlation between the reading readiness test and grade level reading achievement as the level of grade increases. Therefore, it is important to recognize that the steady decline in variance accounted for from the early to the later years does not necessarily represent a slipping away of the initial acquisition of skills. It mainly reflects the fact that in the course of a few years many different events occur that influence performance on most dimensions and that as these accumulate, they dilute the effect of the intervention program. The effect may still be there in later years but it counts for less and less in the total experience of the child. This phenomenon should be recognized and experiments should be designed that take it into account. The surest way to do that is by using very large samples when long term effects are to be assessed. This is, however, more expensive.

The substantial cost of adequate evaluation, too infrequently borne by funding agencies, is bewailed. Especially expensive is daily, on-line, formative evaluation--the type of evaluation desired by our experts. Technology is also lacking.

Specific areas where evaluation is lacking or inadequate include: social and cost benefits of intervention, social-emotional development, adult and child attitudes, the process of learning and the quality of behavior, self-esteem and self-concept, creativity, family relations, life style changes, and locus of control. In addition, inadequacies were mentioned in the ability to assess transfer of program effects, effects on other than the

target child, and precisely how the program works in homes.

Broader problematic areas in evaluation which are mentioned include: the inappropriate use of behavioral objectives in attempting to influence competence rather than behavior; the inadequacy of instrumentation and research design to detect long-term effects and effects produced by repeated testing; the difficulty in keeping adequate records on controls; the over weighting of achievement tests with verbal ability; extraneous variables with potential relevance to program success but which are difficult to measure, and the difficulty of randomizing in field research.

Strong evidence of the panel's concern with inadequacies in the area of evaluation is given by listing the five research priorities they selected by rank-ordering a long list of research issues:

1. Further consideration of the relationship between program development and evaluation.

2. Extension of evaluation beyond IQ and achievement testing to considerations of learning styles and socio-emotional characteristics of children.

3. Exploration of the long term effects of environmental manipulations as well as interventions with children.

4. Consideration of individual differences in intervention program development and assessment.

5. Increased cooperation and coordination in funding and evaluating intervention programs.

5. Child and Family Characteristics and Program Effects

In general, children who are hardest to work with come from disorganized homes, disrupted either by the social and economic pressures of extreme poverty or by emotional problems in the families. The rural poor are mentioned as a unique and difficult group with which to work. Sex and race

typically are not found to be related to ability to profit from a program. While the lower functioning child is generally measured as gaining more in intervention programs, a host of methodological problems, including powerful regression effects, mitigate against drawing significant conclusions from this general finding.

A great deal more work seems to be needed to assess the precise ways in which programs and individuals interact.

6. Program Lacks and Weaknesses

In addition to inadequacies of evaluation and the primitive state of knowledge regarding program-individual interactions, perhaps the other major program lack is the inability to design systems which sustain and maintain positive program effects on children and parents over time and subsequent to intervention. The major problem here seems to be the great number of environments with powerful and competing forces in which parents and children live when not involved in intervention programs. Permanent "inoculations" or "cures" do not, in analogous terms, seem to characterize the state of the art in intervention programs aimed at enhancing development and preventing mental retardation. The specific problem most often mentioned by the panel is the seemingly destructive effect of the typical public school through which the child who has profited from an early intervention program must pass. One of our experts goes so far as to say that early intervention should be abandoned in favor of seeing that something constructive happens in the public schools.

Beyond this sustaining/maintaining problem, other confessed lacks include: difficulty in working with disorganized families, inability to provide comprehensive services to keep all families above the survival level, difficulty in dealing with and understanding the noncognitive aspects of behavior, difficulty in getting fathers involved, lack of readily available

curriculum material (especially at the zero to three age level), inadequate technology in the area of staff supervision and quality control, lack of developed curriculum materials for parents to use in the home, difficulty in producing creativity in children, and program failures brought on by institutional and administrative conflicts.

7. Research Gaps

Throughout the review of the panel's responses, many applied research issues were noted. In this section we consider further gaps, especially in the knowledge base, related to early intervention programs designed to prevent mental retardation. The extensiveness of the gaps relates at least in part to the fact that early childhood development has only recently become an area of intense study in education and the behavioral sciences.

Lack of understanding of the affective domain is singled out as perhaps most significant. Issues here include: relation of emotion to learning, how motivation and self-esteem can be developed and maintained, the role of parental attitudes and motivation in child learning, the general inadequacy of instrumentation, value systems in child rearing, the role of culture versus universal factors in development, cognitive-affective interrelationships, socio-economic status as related to cognitive and affective development, and the development of motivation to learn.

Some more general gaps include: the need to identify sequences of emerging competencies, language development, development in the one to three year age group, the relationship between parent behavior and child behavior, the effects of behavior settings, and knowledge of why some poor children "make it" and others do not.

Research gaps directly related to intervention programs include: the gap between research and application, "what kinds of programs for what kinds of children?", the technology of dissemination and delivery of services to

children, systematic testing of program variations, the development of materials for effective program operation, identification of critical dimensions of programs, retraining teachers for innovative programs, the selection of caregivers, the training of caregivers, and the complex interaction of (1) developmental status of child, (2) number of years in an early intervention program, and (3) later achievement.

8. Criteria for Excellent Programs

Panel members were asked to discuss the quality of some of the existing programs in the early intervention area. It is instructive to itemize the criteria they used to determine quality.

The criteria most often mentioned were (1) the nature and quality of the research design and (2) evidence concerning program effects on children and parents. Another important feature is the use of a consistent and meaningful theoretical position to guide intervention. Further positive criteria included: clear specification of program components; presence of longitudinal evaluative data; ability to deal with the social-emotional domain in addition to the cognitive; presence of quality control systems; reasonable cost; feasibility; meaningful incorporation of parents, and presence of a training program.

Programs for infants and toddlers which are highly regarded by the panel include the work of Gordon, Lally, and Levenstein. Highly valued programs for older preschoolers include DARCEE and the work of Karnes, Sprigle, and Weikart.

9. Issues in Program Export

Despite the gaps and weaknesses discussed above, the experts feel there are several excellent early intervention programs, and they generally agree on necessary program components. Virtually everyone agrees that we have not been successful to date in getting excellent programs widely

distributed to children across the country. (One expert cautions against thinking there is an ultimately generalizable program for all children.) In discussing federal response we will see that the program developers lay much of the blame for the lack of program export on government agencies.

In this section we present the authorities' views on what it would take (is taking in certain current dissemination efforts) to export early intervention programs in order to help prevent mental retardation on a broad scale.

An exportable program should have face validity, be comprehensive, have a well documented curriculum, have proven results, and have evidence on cost effectiveness. Further, there is need for an instructional model or framework and well developed curriculum guides, instructional materials, training techniques and manuals including media, a monitoring system, and evaluative devices. A suggested layout of the program space is also desirable. There should be a general blueprint for approaching communities, negotiating with local intervention systems, specifying staff qualifications, arranging for purchase of materials, and setting up a meaningful and continuing relationship between the developer and the site. Various forms of technical assistance are needed including preservice and continuing inservice training, especially during the first year. The panel members repeatedly cautioned, however, that packaging a program is not foolproof and that a teacher-proof program can only be approximated. Some feel that the teacher-proof method should be avoided, in order to preserve the teacher's integrity (and sanity). Some form of human presence is almost certainly necessary on the part of the R & D organization. In looking at certain productive dissemination projects, the experts point to the importance of the commitment and charisma of the developer.

At the level of the developer's own operation there are many problems,

not the least of which is gaining financial support for the "unglamorous" work of program consolidation and development. Further there are the problems of gaining support from one's own administration (particularly with university-based R & D operations), finding staff willing and able to do development work (including travel for installation purposes), and working effectively with publishers who often find it difficult to relate to intervention work. After the initial development of a prototype of the program at the parent R & D site, several years of field testing are necessary to get a program into disseminable form. This process is long and expensive.

Most innovative interventions are difficult to execute; therefore, substantial difficulties arise in getting the programs operating at a distance from the R & D site. These difficulties include: finding ways of communicating about the program to potential users and involving them in program selection; necessity of making modifications of the program to meet local needs; establishment of rapport and communication between the developer and the site; local community problems; acceptance of change and innovation by school administrators and teachers; working in the context of intervention system politics; adequate financing of the dissemination and implementation effort; selection of competent staff who are willing and eager to engage in the innovative program; problems of training on-site; maintaining quality control and preventing "program drift", and administering the program effectively so that staff morale and motivation are maintained at a high level. Some of these difficulties may be lessened by the use of demonstration centers and tying-in the training to university programs.

The major issues to be emphasized in terms of wide-scale export of programs are time and the related issue of cost. The experts feel that if the federal government is serious about bringing effective programs to

children, it must spend a great deal more on development, dissemination, and export than it is currently spending on relatively short term research and demonstration intervention programs.

10. General Intervention Issues

The panel pointed out many broad intervention issues which ought to concern the federal government. Although not specifically to be covered in this project, day care is one of the issues on which many of our experts could not resist commenting. The nation's seeming headlong rush to day care is of concern to all. Some feel that very young children should not be removed from their homes; rather the mothers ought to be subsidized or a caregiver ought to be brought into the natural home. Some expressed concern over wasting money on buildings for day care, when even if day care is seen as necessary, it could be provided adequately in day care homes which can be upgraded with some fairly simple input. Some cautioned that we ought to face up to the fact that day care is for parents, not for children, and ought to be evaluated accordingly. Further, it may be that demands for educational day care are unreasonable, given the level of staff in day care centers and the enormous cost of excellent, educationally oriented day care. Cost and feasibility aside, it is clear that there are educational and developmental approaches represented in some of the careful R & D work described herein that are being adapted to day care. Early interventionists are divided on most day care issues based on educational and developmental data. The overriding issues in day care seem to be political and economic.

Our panel is unanimously opposed to compulsory early education. They opt for a variety of quality programs and arrangements made available to potential consumers. One panel member is concerned with what he considers a very serious issue: if we have great difficulty in working with dis-

organized families, how can we resolve the moral dilemma of leaving children in such horrible places? (It should be pointed out that he was referring to the relatively small number of very disorganized homes.)

Great concern is expressed about the public schools. Some feel that early elementary teachers place too low intellectual demands and too high conformity demands on children, which can destroy the positive effects of early intervention. Public schools are often described as defensive about innovative early intervention. One panel member expressed the following dilemma: in early intervention programs should we prepare children to survive in schools as they exist now or prepare children differently and hope that the schools will change? He had in mind current public school practice where creativity and abstract reasoning are not valued; rather control of negative behavior, keeping quiet, school-related vocabulary, memory, and fine motor ability are valued. Further, the experts feel that achievement tests measure too narrow a set of abilities.

Some panel members are concerned about the broad institutional issues regarding mental retardation. One expert suggested we should be more concerned with determining how to help all children develop into good citizens, regardless of their IQ level, rather than concentrating on preventing mental retardation. In a related vein, several people are concerned with the relationship between racism in America and the large number of minority group children who are identified as mentally retarded. One expert reminded us that we may be miscasting and stereotyping low-income children since a percentage of children from all economic levels have some difficulty in public school. Many suggest that positive social and educational benefits would attend socio-economic mixing in intervention programs.

11. Issues Concerning the Role of the Federal Government

The issues of time and money, which pervade concerns about export of programs, also pervade the panel's discussion of federal response. The R & D process, which eventuates in wide dissemination of excellent early intervention programs to children, is long and costly.

Intervention programs need planning and start-up time, and by the end of the first year we may be in a position to begin to evaluate. Therefore, usable and meaningful summative data will only be available at the end of a program's second year. At this point, if results are positive, the developer will be in a position to formalize his procedures and begin to produce guides, manuals, and media. Careful pilot field testing to determine the program's operational parameters and feasibility of operation in the field will take several years. By the end of three to five years, a program may be ready for wider dissemination. However, the very process of wide dissemination must be carefully worked out in order to insure quality program operation. In this overall five to seven year process, the costs of the last three to five years are substantially greater than the initial years.

With the above rough schematic of the R & D process in mind, let us list some of the panel's concerns about the federal response: (1) no predictable funding; (2) programs get cut off when near fruition; (3) willingness to pay for "sexy innovation" but not painstaking consolidation; (4) lip service alone paid to interest in longitudinal research; (5) premature push for results and dissemination; (6) inconsistency of priorities and funding patterns; (7) lack of agency monitoring and coordination; (8) lack of continuity in agency management, and (9) lack of understanding of the complexities of the dissemination process.

There are further specific comments about federal agency behavior. Some

feel that the Office of Education has not followed through on its supposed push for disseminable programs and that the regional education labs and R & D centers have not been successful in this respect. Agency jurisdictional disputes have hurt R & D efforts. Research people feel constrained by shifting priorities and comment particularly on the desirability of an NIH-like granting structure rather than a contract or request-for-proposal (RFP) mechanism in terms of encouraging research productivity. Something akin to a contract or RFP mechanism may be needed for later development and dissemination activities.

While the panel members are keenly aware of the pressures on federal agencies, they feel that the typical agency response to these pressures cited above <u>almost guarantees</u> that programs will not get out to the children who need them.

IV

STRATEGIES FOR DEVELOPMENT AND EXPORT

The task group reviewed the organization of the Department of Health, Education and Welfare, agency activities, reports from leading authorities in intervention research, and held discussions with key personnel in relevant federal agencies to discover a systematic surveillance, monitoring, or research product dissemination system that would assure the timely and effective movement of longitudinal/intervention research into service and demonstration programs. The review did not turn up a system designed to go beyond enhancing communication between agencies on strategies for research with potentially retarded children. There was no system available to nurture intervention research programs, to maintain surveillance over the development of research products, to provide technical assistance to research programs or to users, or to coordinate a cross agency export and research product dissemination activity.

There appear to be three reasons for this situation. While there is an increased effort in most federal agencies to support longitudinal research projects and to coordinate and engage in information exchange, there is (1) insufficient manpower, (2) too limited financial resources, and (3) a lack of existing monitoring methods available to make possible an effective research product dissemination activity. In some quarters it is felt that the relative amount of resources placed on the research and development activity, as compared with the export and dissemination activity, is inverted. There is almost universal agreement that there are few greater problems at hand than our seeming inability to develop an effective mechanism to move evaluated research product into effective use.

The review of longitudinal/intervention research projects, interviews

with leading authorities in intervention research, and discussions with federal agency personnel combined to describe the current conditions and led to a proposal for a step toward a solution to this problem.

a. The review of research programs revealed clearly that they are neither funded nor organized in such a way as to be ready to export research products when they emerge. Either the period of funding is too short, the staff is insufficiently trained or inadequate in size, or the mechanisms for product field testing and export are not present.

b. Interviews with leading authorities in the intervention research field included frequent reference to the dissonance between the methodologies and measurement approaches desired by investigators and those required by funding agencies and their review mechanisms. First, these researchers recommend a reorientation of strategy which would call for more emphasis on measurement development, individualizing programs, and the development and long range funding of comprehensive programs with coordinated funding and support by a variety of federal agencies to allow for the export phase.

Second, the leading authorities feel that there should be less emphasis placed on building new structures and special programs for export in favor of better integrating family and neighborhood settings that now exist with early childhood education programs. It is this discrepancy between the program <u>model</u> and the realities of the <u>neighborhood</u> that has led to a chasm between model demonstration programs and existing service programs.

Third, it was felt rather strongly that the rapid changes of national priorities and the consequent instability of funding through federal agencies prohibit effective longitudinal studies and interfere with the development of delivery systems and the export function.

Recent trends in funding through contractual arrangements are reported by these authorities to have inhibited the planning and development of

comprehensive programs in favor of the isolated, uncoordinated special projects now needing orchestration at the national level. This further complicates the difficulty of bringing program pieces together for comprehensive services. Also, federal agencies apparently feel pressure for results from their investments and often press for dissemination of research results before programs have adequately investigated the impact of the programs on the children, the alternative ways of developing an export capability, and the development and delivery of the technical assistance system required to transfer the research product successfully into children's service programs. This crisis orientation has the result of pushing investigators into the public arena earlier than is desired or warranted. A recent paper by Bronfenbrenner (1972) further emphasizes this point and warns us to guard against those pressures in the future.

c. One of the most cogent federal reports, "Toward Interagency Coordination. A Report by the Interagency Panel on Early Childhood Research and Development," October , 1971, (OCD), was reviewed and found to be of great value. It provided an exemplary report on the current thrust toward improved coordination designed to move research and development products more effectively into use.

A small segment of this report summarizes the crux of the problem the task group is attempting to address in this report. It is stated as follows:

> "A related area which needs immediate and extended research, and which is not included by any agency as a priority or problem,is the program multiplier effect. This multiplier effect relates to the problem of moving a program from a proven 'model' or 'demonstration' to a national program. The issue may be seen as part of research utilization and dissemination but that obscures the problem. Economics, technology, sciences and ecology have recognized that a linear increase in inputs does not give you a linear increase in outputs. Usually it takes an exponential increase in inputs to achieve a linear output. We have seen during the 1960s the impact of this factor on Headstart, Follow-through, Job Corps, Neighborhood Youth Corps, Medicade, Medicare, and almost all national programs. This raises a basic issue of whether

> the 'modeling' approach is valid and whether evaluated demonstrations are really worthwhile. Most demonstrations succeed, and most demonstrations never become national programs--where this is attempted, the cost increases and the quality of the program decreases." pp. 65-66.

It is the view of this group that the multiplier or replication activity referred to in this report, which concerns most of the scientists interviewed, most of the federal officials, and the potential recipients, service program administrators and consumers, is the central problem requiring attack at the present time. A national program of technical assistance is implied as a necessary ingredient and an area on which a great deal of concern and work ought to be placed.

Taken in total the review suggested a need for more than simply an improvement of federal mechanisms for maintaining surveillance and assisting in the export function. Instead, a mechanism or system for assisting in the export function should be developed in tandem with a correlated and similar system to assist potential receivers with importation strategies. This would help create the sequence and the linkages required between the research sponsors, the researchers, the practitioners, and the beneficiaries or consumers mentioned in the OCD report as the important components of an entire research and development system.

Such a coordinated system would assist in midwifing research products not only by assisting producers toward more effective export but also by assisting consumers or receivers to engage in more effective import.

Program readiness for export:

At the level of the individual research and development program there are thought to be at least seven critical features necessary to evaluate program readiness for export.

The first is a management system. In other words, does the research-exporter have a staff which can (a) provide local workshops, (b) travel on systematic consultations, and (c) monitor data from the site for formative evaluation and training decision making purposes? Does the researcher have institutional support for exporting (that is, is the reward system at the researcher's institution such that he will profit from becoming an exporter)? Does the researcher have the kind of local arrangements which will free him to continue his research while maintaining contact with his exporter staff so that there is feedback in both directions? Is the local institution organized to provide the kind of rapid decision making and flexibility essential for program delivery at a distance.

Second, training materials must have been developed to the point where they are useful to consumers and others aside from the exporter, his staff and members of the research activity. Training materials must include films, video tapes, slides and printed materials. The language level used must be appropriate for prospective consumers whether they be professionals, para-professionals, parents or laymen. The training materials must be explicit enough for naive users to move rapidly into an understanding of the program. The training materials must have been field tested in the original research project and in at least one place distant from the project.

Third, there must be curriculum materials which clearly designate what potential users should do with children, parents, community, and other features of the receiver system. The curriculum materials must have been field tested. They must be specific enough that the user knows not only the content but also the methods of instruction for applying them. Questions as to

availability, cost and consumability of materials must be answered.

Fourth, there must be technical assistance available for training and utilizing evaluated research products relating to intervention strategies.

Fifth, there must be project specific evaluation materials for formative evaluation. There must be performance based criteria and tests developed around them. If the classroom teacher or paraprofessional is expected to have the capability to evaluate, are there instructions and materials at the proper level available to do this?

Sixth, does the researcher-exporter have a set of local criteria which must be met before he is willing to work with a local group? In other words, have importation strategies been sufficiently developed to allow the potential consumer and receiver systems to make use of the product exported by the research organization? The consumer must desire the product, understand the meaning of its importation, and have the trained manpower available to implement it.

Seventh, reasonably effective replication should be possible with most intervention program methods and materials without need for a prolonged and intimate interaction with the researcher-exporter. Independent of the matter of the availability of technical assistance, the programs developed should be sufficiently public and repeatable that they do not depend entirely on the personalities, styles, level of motivation and other resources available to the originators or producers of the program.

In general, the major problems which interfere with the effective delivery of quality intervention programs from longitudinal/intervention research projects are twofold: (1) the continued absence of well developed programs ready for national dissemination and (2) the absence of effective staff development and training systems. These two problems go beyond the question of readiness of research product for export or the readiness of a

program to engage in export activities. The task group has attempted to articulate the essentials of a well developed system that should characterize the intervention research program that expects to engage in effective export activities. (A more complete and extensive report on intervention program delivery systems is being developed.)

Delivery system components:

One of the key dimensions that programs vary on is their scope. Ideally a program should be as comprehensive as possible to meet a variety of developmental needs, including psychological, medical, social and educational needs. The first consideration, therefore, is to determine the program components that must be developed and, if possible, the theoretical orientation to guide the development of the components. This is necessary not only in the training of intervention research program staff but of the staff members of potential consumer systems, such as day care centers and schools.

The most effective way to conceptualize a program is to develop written policies and procedures that specify how each component is to be organized. These policies and procedures manuals should include (1) overall goals, objectives, policies, and the structure of the comprehensive program, (2) child care and child development programs for infants, toddlers and pre-schoolers, (3) parent-child involvement, (4) family involvement and education, (5) health services, (6) social services and counseling, (7) nutrition and food services, (8) community relations, (9) staff training, and (10) administration and supervision of the program.

Early in the process of program development, a prototype product should be developed. In order to develop a prototype product that is ready for testing, six steps must be completed:

1. Specification of objectives for each component.
2. Specification of criterion measures for objectives.

3. Designation of the activity necessary to attain the objectives.
4. Specification of material, equipment and special arrangements required in activities.
5. Specification of costs.
6. Integration of activities into a schedule that allows for sequential development.

Pilot testing should then take place including:

1. Specification of procedures for each population included in the test.
2. Designation of a feedback evaluation system.
3. Implementation of a try-out for a cycle of time appropriate to the nature of the prototype.

Finally, field testing should take place. The field test may require cycles such as initial limited field test and then an extended field test. The criteria for each cycle must be specified; however, the following steps are involved: specifications and implementation of a plan for more widespread use and a try-out of a revised prototype with provision for comparison against alternative approaches.

Training:

It is critical that a staff development and training program be available in order to assure efficient intervention program operation and the ability to export evaluated products. Otherwise staff features needed for implementation cannot be known by potential consumers.

The essential features of preservice and in-service training programs are:

1. Goals and objectives for the development of trainee competence.
2. Planned preservice and in-service training programs tailored to the needs of the categories of personnel to be trained.
3. A system of competence levels related to a career ladder along which advancement is possible.

4. Emphasis on all aspects of the programs being directed toward helping children develop to the fullest extent of their abilities.
5. Emphasis upon the role of the parent and of the family as major factors in the child's development.
6. Resources for presenting principals and their application to a child development and early education program.
7. Instruction in the related services that form a part of the comprehensive program.

Programs must be developed for preservice and in-service training for all personnel in an intervention program. These training programs are developed primarily to implement a particular program model; however, there are some common denominators across training efforts.

Installation:

The installation of a longitudinal/intervention program away from the research project home base is a substantial problem. It is important to review and analyze the critical features of research products that are required before export is possible and the important features of an export or dissemination process.

It probably takes at least three years from the time a longitudinal research has been conducted until an effective delivery system including the training materials, is developed. It has been thought that regional educational laboratories or other forms of research and demonstration centers could pick up research products, develop them and effectively disseminate and insert them into receiver systems. This is now subject to question. It is felt by this task group that the most effective group for the development of dissemination and installation activities is the group that originated the intervention program. This capability, together with a coordinating mechanism at the national level, would assure the rapid and effective transit

of evaluated research product into service use. In developing this, the research organizations must comprehend more of the features of the potential receiver systems and the potential receiver systems must develop many of the features and capabilities of the producing research organizations. Our experience with "Follow-Through" has been a productive one in that it has enabled us to see what the issues and problems are. Perhaps a mounting of a similar operation at the preschool level for potentially retarded children using the Follow-Through model would be extremely worthwhile.

Importation strategies:

It is interesting to note from our interviews with the leading authorities in intervention research that a problem of equal dimension to the organization and strategies for research programs to export their products is the problem of assisting receiver systems in the development of importation strategies or strategies for assimilating exemplary programs into existing programs for children at the community level. While there is a wide range of settings that can acquire exemplary programs, there are common elements that cut across these settings. No matter what the consumer characteristics, each program has patterns of service delivery that are predictable. In early childhood services, educational intervention is applied in the broadest sense of that word. That is, an educational structure will be the usual setting within which the services and the exemplary intervention strategies will be delivered. Therefore, acquisition settings will typically be educational settings and analyses of these systems should assist us in developing importation strategies.

Any attempt to coordinate or orchestrate the development and delivery of intervention programs must focus on the import as well as the export side of the transaction. Therefore, a system for developing and delivering technical assistance to both sides of the transaction would constitute the

most effective new federal mechanism. The facilitating activity would not simply include information but also technical assistance in the form of competent and talented people brought to the task for the express purpose of moving research products successfully into the hands of the consumer.

A Proposal for a Federal Mechanism:

In order to develop a coordinating mechanism at the federal level, some existing obstacles noted by researchers, federal officials, and this task group, must be removed. There must first be developed a positive climate for federal agencies within which it is safe and rewarding for them to communicate with each other, to inform and advise one another, and to engage freely in information and research product dissemination. This positive climate is not as present in federal agencies as is needed, since the established procedures require them to compete with one another for apparently diminishing resources from Congress. This is especially true in areas where complex social issues are involved. This lack of "horizontal" communication across agencies is compounded by inadequate and restrained communication "vertically" between federal agencies and projects receiving support either from them or from another federal agency. This dampened communications system must be opened up and orchestrated.

In the current arrangement, federal agencies often (1) seek already successful projects to fund, (2) carefully guard projects they have funded which have become successful or (3) frustrate attempts by high level administrators to coordinate agency activities so that their agency's care before Congress can be more potently made. Agencies supporting R & D activities should be relieved of the necessity of having to engage in such behaviors since they inhibit attempts to develop interagency communication, program coordination, and research product evaluation and dissemination.

In short, agencies, in the process of obtaining budgets for subsequent years, fail to develop the free exchange of information and the extent of communication and coordination needed to improve the flow from research to development to service. The scope of this problem becomes very apparent when one attempts to cut across federal agencies and their support programs in

order to obtain information about project status, future directions, or to obtain multiple funding for a single project.

Not all of the fault for restricted coordination and communication should be attributed to the federal agencies. Researchers and research programs should rig from the outset for the export function and should work toward developing mechanisms within their own projects which will support that activity. Pressures from outstanding researchers that would require those features should be more vocal and data should be presented to show that such programs can be mounted if support were forthcoming.

A System for Educational Research Futures (SERF):

A remedy for this situation might exist in a System for Educational Research Futures (SERF). This would be a system that would maintain a constant surveillance and evaluation activity, principally of longitudinal/intervention research projects supported by HEW agencies, and would be directed toward developing successful early education intervention programs for high risk children.

SERF would be charged with the responsibility at the national level of developing and maintaining longitudinal/intervention research activities, for monitoring the progress and development of those activities, and for evaluating the projects and products as they emerged from the research programs. In addition to the surveillance, monitoring and evaluation function, the proposed system would include the following features:

1. SERF would assume a major portion, or perhaps all, of the cost of promising projects without relieving the supporting federal agency from either the responsibility for continuing communication and technical assistance to the project or the credit for having developed the promising project in the first place. The federal agency would be kept "in the limelight" and the monitoring system (SERF), while "picking up the tab", would do so in a

very low profile way.

2. Monies previously earmarked for the promising project by the initially supporting federal agency, but which are now freed up by SERF having taken over financial responsibility, could be deployed by the federal agency in any manner it saw fit, providing the expenditures remained within the agency's area of responsibility and authority. This would make it profitable for federal agencies to bring promising projects to the attention of a monitoring system like SERF without fear of losing the high visibility or the promising project. At the same time money would be freed up for the federal agency to use to develop or support similar enterprises within the federal agency's own goals and objectives.

3. A special review board made up of outstanding researchers, administrators, and potential consumers would guide the identification, selection and development operations of SERF. This board of experts would essentially be the screening group that would receive and rule on candidate projects recommended for possible support from SERF.

4. The cost of the board of review should be supported through private funds rather than public funds in order to assure maximum flexibility of action and to avoid the necessity of attaching the board to any one of the agencies with the resultant suspicion of bias toward the "parent" agency.

5. A major portion of the SERF budget for program support should be from private funds also. Beyond recommending private financial supports for the board of review, up to half the budget for the proposed SERF system should be private funds in order to provide (1) flexibility in the use of the funds, (2) the capability of an immediate response to the needs of a promising project, (3) the ability to augment the budgets of promising projects for categories of personnel or materials which are either prevented by low federal budget resources or restricted by grant management policies and

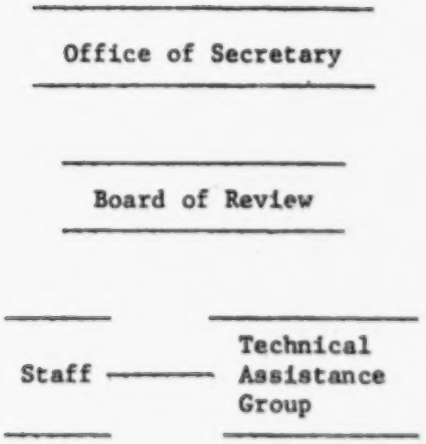
(4) further stimulation of the investment of private resources in the intervention research and export business.

It would be fruitful to consider a number of sources of support for such private funds including major foundations, life insurance companies, large corporations and grants from special interest organizations, including the National Association for Retarded Children, United Cerebral Palsy, The National Foundation and others. Of course, all financial resource transactions and expenditures would be public and auditable.

6. The system should be developed and conducted over a five year period and evaluated with regard to its effectiveness in identifying promising projects, assisting in their further development, in conducting field evaluations of research products, in disseminating research products, and in developing and utilizing research product export activities, including an effective technical assistance development and delivery system for potential receivers.

The essential features of (1) a public-private partnership, (2) an incentive plan for federal agencies to participate, and (3) a technical assistance program to assist in the implementation of intervention programs constitute the best ways in which to expedite evaluated research products while maintaining an organizing mechanism at the national level.

S E R F



Organization of SERF

The organization for the System for Educational Research Futures (SERF) would be relatively simple.

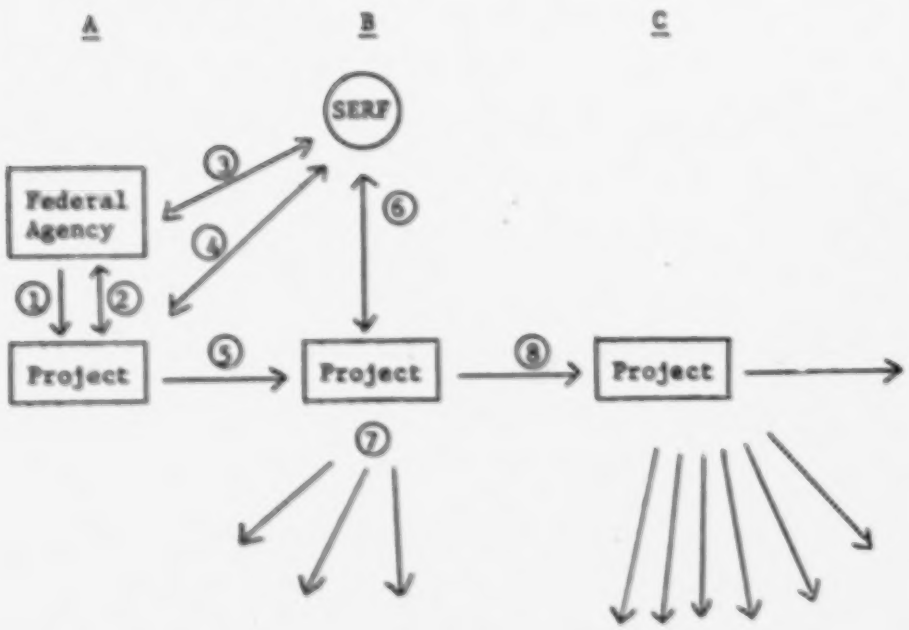
A Board of Review made up of a Chairman and nine additional members from researcher, program administrator, and consumer organizations would review longitudinal/intervention projects presented by the staff and operating committee as candidates for support from SERF. The candidates would be projects that had demonstrated promise for development of effective intervention program strategies or methods, materials or other research product ready for the demonstration, dissemination and export phase. The Board of Review would decide on the propriety of the candidate for support from SERF, the conditions under which support would be provided, and the establishment of a contract or agreement with the project and funding agency on the duration and extent of support from SERF.

A small staff to support the activities of the Board of Review would consist of an Executive Director, three staff assistants and secretarial supports. The staff would be responsible for the development and deployment of technical assistants from a technical assistance group for the investigations, evaluations, monitoring, surveillance, dissemination, export and implementation features.

The Board of Review membership would meet bimonthly, the staff would be full-time, the technical assistance group membership would be on call.

The technical assistance group would consist of approximately 100 specialists in the area of intervention program dissemination, export and evaluation processes. These technical assistants would be engaged on a part-time or contracted basis, on a daily or weekly schedule, in order to assist candidate projects or intervention programs supported by SERF in need of technical assistance to move to the export phase.

SERF Action



SERF Action

A candidate project would go through three phases-- A - initial stimulation and support by a federal agency, B - transition to special development by SERF, and C - placement on local supports for the continuous dissemination and export activity.

In Phase A the project would be developed and supported through the usual process engaged in by the federal agency involved. In Phase B the project would be supported by SERF but would be maintained on the charts of the initially supporting federal agency and "owned" by that agency. In Phase C the project would be on other supports than either the federal agency or SERF. The time distance from the beginning Phase A to the beginning of Phase C will vary between three and five years.

The steps in the process of transition from initial project to autonomy and local support would be as follows:

1. The federal agency would grant support to the longitudinal/ intervention research project.

2. The project would continue its interactions with the federal agency, including the reporting and "normal" contacts between grantee project and grantor agency now in common practice.

3. When the project reached a level of promise in terms of successful intervention program development and candidacy for export phase, the federal agency would bring the project to the attention of SERF.

4. SERF would contact, evaluate and support the promising projects.

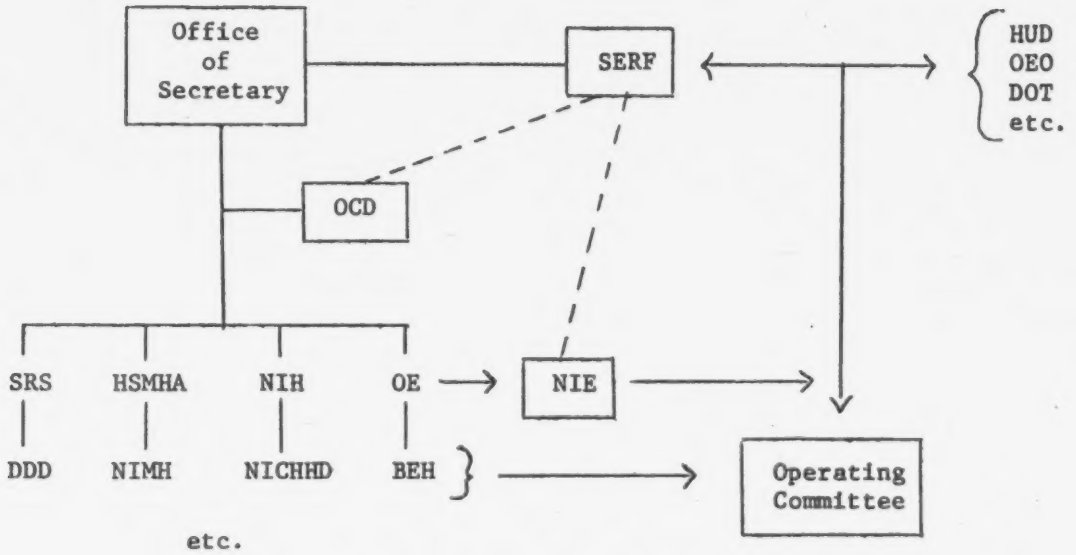
5. The project would move into SERF control for development to the export phase.

6. The development phase.

7. Prototype development and field test.

8. Autonomous continuously disseminating project.

Department of Health, Education and Welfare



Organizational Arrangements for SERF

The organizational arrangements for SERF might be as indicated above. The Board of Review would be attached directly to the Office of the Secretary of the Department of Health, Education and Welfare. The Board might be attached specifically to the Assistant Secretary for Program Planning and Evaluation. SERF would have systematic communications with the Office of Child Development (OCD), the National Institute of Education (NIE) in the Office of Education, and with the special components of HEW, the Division for Developmental Disabilities (DDD) in SRS, the National Institute of Mental Health (NIMH) in the Health Services and Mental Health Administration, the National Institute of Child Health and Human Development (NICHHD) in the National Institutes of Health and the Bureau of Education for the Handicapped (BEH) in the Office of Education.

The operating committee which would include representation from the components of HEW supporting or dealing with longitudinal/intervention research projects (or concern with the export and importation problem) would meet more frequently with the staff members of SERF to develop candidates for the system and review operations and project directions.

Liaison would be maintained between SERF and other federal agencies including Housing and Urban Development (HUD), the Office of Economic Opportunity (OEO), the Department of Transportation (DOT), and other relevant agencies.

Technical assistance system:

At least one national network of demonstration projects designed to expand services for preschool handicapped children is now in operation with support from the Bureau for the Education of the Handicapped (BEH). In this network there now exist ninety-six community model centers attempting to demonstrate various intervention strategies with many categories of handicapped children, including a large segment of the high risk potentially retarded child population.

A comprehensive technical assistance program is supporting this network of demonstration centers which places its heaviest emphasis on the provision of program planning and evaluation, intervention, parent training, information and media, and replication strategies, including network development for importation strategies. This technical assistance system and the network of demonstration centers should be examined as a model for expediting the products of longitudinal/intervention studies and brought into closer interaction with the R & D organizations and projects operating around the country. Without technical assistance, no potential service customer can receive and use research products from this area. The key to export is the ability to train personnel to deliver the programs and to develop a system within which technical

assistants can bridge the gap between the research and the user organizations. SERF is an attempt to describe a mechanism at the national level that would fill the gaps that are now seen as the fundamental inhibitors to implementing the effective intervention strategies now available from the several longitudinal/intervention projects throughout the country.

V

SUMMARY

For over ten years a major effort has been underway in the child development research area to develop and evaluate the effects of early educational intervention programs on the social and intellectual abilities of preschool age children at risk of mental retardation because of environmental factors. Various points of view have arisen regarding this enterprise, not just along dimensions of efficacy and alternative program approaches, but on the best methods for moving the research products into service programs.

This report includes the results of three activities designed to provide assistance in understanding and dealing with the problem: (1) a review of longitudinal/intervention research projects for potentially retarded children, (2) a survey of leading authorities in the field of intervention research, and (3) a proposal for developing a federal mechanism to encourage and assist in exporting into service programs the evaluated products of the research activities.

The research project review indicated that positive results are obtained from participation in intervention programs, and that the value varies as a function of characteristics of the program, of the child and of the child's family or social setting.

The survey of leading authorities highlighted important problems in the conduct of intervention research, essential elements of programs, training and staff considerations, and a discussion of issues on the federal role in research and program development in this area.

The proposal for a federal mechanism centered on a need for orchestration of the national research, demonstration, development and dissemination effort in order to assure timely movement of successful program components into service.

The proposed mechanism, a system for educational research futures (SERF), combines a public-private partnership approach to product export, an incentive plan for federal agencies to identify promising programs, and a systematic surveillance and technical assistance activity to assure export and to assist potential consumers to engage in successful import strategies.

In general, intervention research appears to be a fruitful endeavor but in need of considerable refinement prior to massive dissemination to children's services. Assistance at the national level would help assure the ultimate development of such services but only if the meager resources now available are augmented and a national commitment made to solve the problem.

Appendix A

Criteria for Screening Intervention Research Projects

1. Recency - evaluation data published since January 1, 1968.
2. Availability - descriptive and evaluative reports on hand.
3. Completeness - sufficient information available to evaluate the program. Based on sound theory and/or procedures.
4. Population - disadvantaged high risk or potentially mentally retarded children at 0-6 years of age. Any reasonable definition of "disadvantaged," high risk, or potentially mentally retarded was acceptable, e.g., economic, cultural, ethnic.
5. Sample - representative of the defined population and a minimum size of approximately thirty (30).
6. Reference - national/local norms and performance of a control group.
7. Treatment - focused on cognitive improvement; unconfounded by non-treatment components; administered for a minimum of 80 hours. Documentation of procedures. (First step of exportability.)
8. Measures - standardized ability or achievement instruments or specially constructed measures with reported and reasonable reliabilities and validities. Criterion reference program oriented, etc. Some evaluation of cost benefit of evaluation desired.
9. Evaluation - completed, sound, and in terms of cognitive and/or affectual benefits.
10. Statistics and Statistical Analysis - properly selected, used, and interpreted, non-parametric and evaluative (decision oriented research as well).

11. Reliability - statistically significant treatment comparisons and/or differences in favor of the program: $p < .05$. (Gain scores to be evaluated for regression, reliability or appropriateness.)

12. Educational Significance - ability or achievement tests gains maintenance greater than expected or observed for control population during a comparable period of time in a treatment program.

13. Treatment Replicability - part of 15 but a first step exportability.

Based on AIR, 1971 study ED 055 128.

APPENDIX B. MATRIX OF INFORMATION ABOUT EARLY INTERVENTION PROJECTS

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
Learning to Learn program; by Sprigle in Jacksonville, Fla.; 3-yr. program begun in 1965; funded by OEO, Carnegie, and OCD	Child Variables: 4-6 yr. old, lower and lower middle class children; physically normal Family Factors: income: group I. $3000; II. $6400; mother's education: I. not considered; II. high school or less	Large urban setting; agency-based prog.; parent involved as client; program content included acad., lang., social skills, and affective component; Piag. curr.; staff included pro. and parapro. (1:1); adult:child ratio: 1:12 (age 4), 1:11 (age 5); teacher behavior, cognitive open; pre-program and in-service staff trng.	Performance-based goals; nonequivalent control group design; sample sizes: E4=23, E5=21, C4=21, C5=21; attrition rate=-5 for 4-yr.-olds, -4 for 5-yr.-olds; repeated meas. used; external eval. by U. of Fla.; performance to date indicates success	Report written in 1971-72; material available and complete; is replicable; training and curriculum materials available; some curr. materials have been published
Perry Pre-School Project; by Weikart in Michigan; 3-yr. program, begun in Sept. 1962; funded by Ypsilanti Public Sch., USOE, and DHEW	Child Variables: 0-3 yr. old Black children; potentially mentally retarded; physically normal Family Factors: included in a deprivation formula with other factors	Small city setting; both home and agency-based programs; parent involved as teacher of own child; program content Piag. Cogn.; curr. types Piag. and local; staff composed of pro.	Normative goals; data collected by stand. tests	Piag. curr. published; technical assistance from Hi-Scope, Inc.
Ypsilanti-Carnegie Proj.; by Weikart in Michigan; 3-yr. prog. begun in 1968; funded by Carnegie 68-70; (Cont'd)	Child Variables: 4-6 yr. old Blacks Family Factors: included in a cultural deprivation formula with other factors	Home-based prog.; parent involved as decision-maker; Piag. cogn. program; Piag. curr.; staff inclu. pro. and parapro.; teacher behavior cogn. open	Normative goals; data collected by stand. tests; monitoring measures=video tapes	Developing video tapes

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
now funded by non-profit orgn.				
Children's Center, by Lally at Syracuse U.; children in prog. until kindergarten; prog. begun in 1969 (earlier prog. with older children begun in 1964); funded by OCD	Child Variables: 108 children aged 0-3 yrs; 1/2 selected during 3rd trimester of mother's preg.; 1/2 when child was 6 mos. old; none were potentially MR; 70% Black, 30% White; all from low SES; 1/2 male, 1/2 female; physically normal; most were 1st borns, but some were 2nd or 3rd Family Factors: 23% of children had 2 parents; 77% had mothers only; all were high risk (disorg.); all incomes below $5000; 50% of mothers were 18 at birth of child; 50% were 18-20; all mothers had less than high sch. ed. when entered	Urban setting (300,000 pop.); parent involved in advisory position for center; home visits emphasized nutrition, health, psycosocial dev.; Infant Prog.: 6-15 mos., Piag. and Erickson; 15-36 mos., open edu., multi-grouping by age; prog. included acad., lang., Piag. cogn., motor trng., social skills, and affective component; 36-60 mos., prog. included all above categories in new location; staff included pro. and parapro; adult:child ratio=4:1; teacher behavior affective; classroom structured by space not by time; teacher is reactor more than teacher; 2 full-time staff to train teachers: 16 for class and 8 for home visits	Beh. objectives; quasi-experimental design; children matched on 8 variables; less than 2% attrition if 15 mo. duration is reached; repeated meas. used (cross-sec. comparisons at 6, 12, 18, 30, and 36 mos.); reliability confirmed (Hunt, Escalona, Decarie to 36 mo.; after 36, Cattell, ITPA, Bonit, Emmerich Scale, and weekly home visits); appro. stat. anal. included non-parametric, correlations, and anova; data collected by observa., stand. test, perf. crit., and interviews; unplanned outcome: day care offered mothers a chance to work, which offered them a higher style of living, job trng. prog., more efficient use of com. resources; external eval. by ABT Assoc.; results: at 36 mos., mean Binet =115; also positive findings on social- (Cont'd.)	Transported to 3600 children in 18 counties in Kentucky; training material: book, Infant Caregiving: A Design for Training, available through Media Projects, Inc.; technical asstce. for Kentucky project, 3 people visit every 3 mos; eval. report is avail.; this project not tight, was designed to be modified; concepts are being exported

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
			emotional measures; cost per child=$2.00 per hour	
Responsive Care Model, by Meyer and Lay at Syracuse U.; 2-yr. program; begun in 1970; funded 1/2 by Syracuse U. and 1/2 by OE	Child Variables: 22 nee Dec. 65-Nov.66; 18 nee Dec. 66-Nov.67; now getting 3-yr.-olds transferred from Lally; none potentially MR; 24 Black, 16 White; social class: 18 pro., 6 semi., 11 unskilled, 5 unemployed; 17 males, 23 females; several premature; all physically normal Family Factors: 22 families had no father; incomes varied from $0 to $10,000; age of mothers ranged from 20 to 45; educa. of mother ranged from grad. degrees to no high school	Urban setting (Syracuse); center-based program; parents attended meetings but not decision-makers; program included acad., lang., Piag. cogn., motor trng., social skills, and affective component; Responsive Care Model for curr. (BIS); staff composed of pro. and parapro.; adult:child ratio=8:1; teachers allow children to take initiative in 3 carefully designed rooms; staff ratio=1 trainer to 6 trainees; social services, health services also provided (not true for original sample of 40)	Stated goals=program objectives for teacher to choose from; sample size=20 early interven, 20 late entry; groups compared on anova's; yearly testing on stand. tests; no attrition; unplanned social outcome=greater interaction among children; results: mean Binet for early entry=105, late entry=103; cost=$37.50 per child per week in 1970	Training material=series of booklets; curr. material=series of 7 source books; tech. asstce. full time for 6 weeks; eval. materials in progress; specific criteria set for buildings and staffing; instruction is loose but parameters and guidelines are tight
Mother-Child Home Program; by Levenstein in New York; 2-yr. prog. (Cont'd.)	Child Variables: Black and White lower class children (Cont'd.)	Large urban setting; home-based prog.; parent involved as client and as teacher of own child; (Cont'd.)	Normative and affective goals; sample size=54; control group was included; attrition data available; (Cont'd.)	Report written in 1972; material available and complete, including training material, curr. material, eval. materl.; (Cont'd.)

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
			development for para-pros.; monitoring measures: live observation and self-report; performance to date indicates success; cost for 30 children= cost of preventing 5 children from MR treatment	
Far West Lab, by Nimnicht; 1 year HSPV, 4 years HS-FT; begun in 1968; funded by OE, OCD, and Carnegie	Child Variables: 3-9 yr. old lower class children; both sexes Family Factors: no particular pattern of marriage or risk; "ability to attend to child" impt. (parent's disposable time); # of people in home, density, and income considered	Rural, small city, and large urban settings; agency-based program; parent involved as client, worker, and teacher of own child (not required but available); Piag. cogn. program (responsive); Piag. and Mont. curr.; staff composed of parapro.; teacher behavior cogn. open; prog. advisor had 10 classrooms; 2 weeks of pre-program trng.; 3 1-week training sessions; on-site visits by full time staff; training is pointed toward prog. advisor; other prog. dimensions included nutrition, health, social ser., psych. and dental ser.	Perf. based, normative, and affective goals; sample size=approx. 1000; control group in one place (previous cohort as comparison group); no attrition data; repeated meas. used; reliability (usually) confirmed; appro. stat. anal. (multiple regression); data collected by stand. test and perf. crit. (not typical achvt. test but structured sit., locus of control, level of aspiration); other sources included perceptions of teachers, physical facil., and interviews with stake holders; (Cont'd.)	Report written in 1972; material available and complete (is replicable); training material, curr. material, and eval. materials are available; tech. asstce. recd.; management system; set of local criteria estab.; looseness of export was indicated

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
			external eval. by Stanford Res. Inst., Head Start, and Follow-Through	
Early Infant Education Program; by Schaefer in Washington, D.C.; begun in 1965; funded by NIMH	Child Variables: 0-3 yr. old Black male children Family Factors: most children from married families (wanted stable homes); low density; $5000 or less income; mother's education less than 12 years	Large urban setting; parents involved as teachers of own children; local curr.; staff composed of pro.; teacher behavior cogn. open; pre-program and in-service training for staff	Normative and affective goals; sample sizes: exp. group=approx. 30, control group=approx. 30; no attrition data avail.; repeated meas. used; appro. stat. anal.(anova); data collected by stan. test (Binet); other sources =observa. of parents; performance to date indicates mixture of success and failure	Report written in 1970; material available but not yet complete
Early Trng. Project: Center and Home-Based Study; by Klaus and Gray, in Tenn.; group T1-10 week preschl. for 3 summers plus 3 yrs. wkly. home visits; group T2-2 summers plus 2 yrs. of (Cont'd.)	Child Variables: 3.5 to 4.5 yr. old, Black children, lower class, both sexes, physically normal Family Factors: both father-absent and father-present homes; families averaged 7 members; crowded density; (Cont'd.)	Program included acad., lang., motor trng., social skills, and affective component; local curr. type; 1 adult to 4-5 children; staff included pro. and parapro.; teacher beh. local; supervision, pre-program, and in-service staff training	Perf. based and normative goals; sample size: treatment=38; 2 control groups (local and distal); attrition data reported; repeated meas. used; appro. stat. anal.; data collected by stand. test (Binet, WISC, ITPA, and PPVT) and interviews with mothers; performance (Cont'd.)	Training and curr. materials available; set of local criteria established

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
intervention; conducted 1961-66; funded by NIMH	income level: T1=$1000 per year; T2=$2000 per year; all had unskill. or semi-skill. jobs; average parental edu. =8th grade		to date indicates success	
Vertical Diffusion Study: Center and Home-based; by Gray in Tenn.; 2-yr. program; begun in 1966; funded by NPECE and OEO	Child Variables: target child, 3-4 yrs., siblings, 18 mos.; Black, lower class, both sexes, physically normal Family Factors: 1/4 father-absent homes; average family size=6; all subjects qualified for low-income housing	Small city setting (25,000); both home- and agency-based prog.; parent involved as teacher of own child; program content included acad., lang., motor trng., social skills, and affective component; adult:child ratio=1:4,5 (center), 1:1 (home); staff composed of pro. and parapro.; teacher behavior local; supervision, pre-program, and in-service staff training	Perf. based and normative goals; sample sizes: treatment--MI=20, Curr=20, HV=20, Sibs=25; control group N=20; attrition data reported; repeated meas. used; reliability confirmed; appro. stat. anal.; data collected by stand. test (WAIS--mothers, Binet, and PPVT), and by perf. crit. (Gilmer-Basic Concept Test), and by interviews with mothers; home visiting for one mother-child pair=1/5 cost of MI treatment (center-based prog. and weekly home visits) and as effective in making changes in sibs.	Recent report written; material available and complete

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
Educational Intervention in the Home and Parapro. Career Development; by Gray in Tenn.; 40-week prog.; 1968-69, 1969-70; funded by OEO	Child Variables: 3.5 to 5.5 yr. old, Black, lower class children of both sexes; physically normal Family Factors: 59% father-absent homes; average family size=7.5; all subjects qualified for low-income housing	3 groups: HV=home-based; Curr.=agency-based; MI=both; parents involved in HV and MI as teachers of own child; parents not involved in Curr. gp.; basic program content is to teach the mother to be an effective teacher of her child in her own home (build child's potential for school success by working through mother); local curr. type; staff composed of parapro.; teacher behavior local; supervision, pre-program, and in-service staff training	Perf. based and normative goals; sample size: exp. groups, N=12, N=10; control groups, N=12, N=10; repeated meas. used; reliability confirmed; appro. stat. anal.; data collected by stand. tests (Binet and PPVT) and by perf. crit. (Concept Test: Maternal Teaching Style Instrument with mother); performance to date indicates success	Recent report written; material available and complete (training and curriculum materials); set of local criteria established
Effects of 3 Home Visit. Strategies on Children's Academic Apt. and Maternal Teaching Beh.; by Gray; 30-wk. program; funded by OE	Child Variables: 6 yr. old, Black, lower class children of both sexes; physically normal Family Factors: 50% father-absent homes; average family size=7.5; crowding ratios reported; (Cont'd.)	Large urban setting; home-based program; parents involved as teachers of own children; program content included 3 different strategies: mother-involved, cogn. emphasis; mother-involved, gross motor skills emphasis; home visitor worked with (Cont'd.)	Perf. based and normative goals; sample size=54; control groups, local and distal; repeated meas. used; reliability confirmed; appro. stat. anal.; data collected by stand. test (Metropolitan Ach. Test) and by perf. crit. (maternal (Cont'd.)	Recent report written; material available and complete (training and curriculum material); tech. asstce. recd.; set of local criteria established

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
	families lived in housing project; avg. age of mother=28	child rather than mother, cogn. emphasis; local curr.; staff composed of parapro.; teacher behavior local; supervision, pre-program, and in-service staff training	teaching style); unplanned social outcomes reported; performance to date indicates success	
Home Visit. with Mothers and Infants; by Gray in Tenn.; 8-9 mo. prog.; begun in 1970; funded by NPECE	Child Variables: 7-9 mo. old, Black and White, lower class children; physically normal Family Factors: average education of mother=10th grade	Small city and large urban settings; home-based programs; parent involved as teacher of own child; focus of home visit was on infant growth and dev.--gross motor, fine motor, cogn., lang., and personal-social dev.; local curr.; staff composed of parapro.; local teacher beh.; super-vision of staff	Perf. based and norma-tive goals; sample size =20, control group=20 (post hoc); repeated meas. used; reliability confirmed; appro. stat. anal.; data collected by observation (STIM), stand. tests (Bayley, Griffiths, Uzgiris-Hunt), perf. crit., and interview (STIM); monitoring measure= perf. crit.; perf. to date indicates success	Recent report written; materials available and complete (training and curr. materials); technical asstce. recd.; set of local criteria estab.
Major Interven-tion Project; by Gray et al.; in Tenn.; 1-yr. program begun in 1969; funded by NPECE	Child Variables: 4 yr. old Black and White, lower class children of both sex-es; physically normal Family Factors: 2/3 father-absent homes; all high risk (Cont'd.)	Large urban setting; agency-based prog.; parent involved as teacher of own child; program content local; curr. local (DARCEE); staff composed of pro. and parapro.; adult: child ratio=1:4,5; (Cont'd.)	Perf. based and norma-tive goals; sample size =22, control group=24; data collected by stand. tests (WAIS, WPPSI, Verb-Lang-Test, MFFT, Level of Aspira-tion), perf. crit. (Gilmer Maternal Teach. (Cont'd.)	Recent report written; material complete and available (training and curr. materials); set of local criteria established

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
	(disorg.); average no. of people in home=5.5; average income=$2500; average age of mother =28; average education of mother=10th grade	teacher behavior local; supervision, pre-program, and in-serv. training for staff; health and social services also provided	Style for mothers, Racial Pref. Test), and interviews (racial attitude interview with mother); performance to date indicates succ.	
Head Start (DARCEE) Program; by Dokecki in Tenn.; 1-yr. program, 1971-72, 1972-73; funded by Head Start funds	Child Variables: 4-5 yr. old Black and White, lower class children of both sexes; physically normal Family Factors: 1/2 father-absent homes; all high risk (disorg.)	Large urban setting; agency-based prog.; parent involved as worker and as teacher of own child; program content included acad., lang., motor trng., social skills, and affective component; curr. type local (DARCEE); adult:child ratio=1:8; staff composed of pro. and parapro.; teacher behavior local; supervision, pre-program, and in-service staff training; health and social services also provided	Perf. based and normative goals; sample size=18, control group =18; repeated meas. used; reliability confirmed; appro. stat. anal.; data collected by observa. (time sampl. ecol.), stand. tests (WPPSI, Caldwell, Slosson, and PPVT), and perf. crit. (NPECE, Basic Skills); monitoring meas.=live observation	All publications in progress (training and curr. materials); set of local criteria established

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
Infant Education Center; by Heber in Wisconsin; 3-yr. program; funded by OE	Child Variables: 0-3 yr. old. lower class, Black children; potentially MR Family Factors: average IQ of mother - below 70; mother's education low	Large urban setting; agency-based prog.; parent involved as client; program content eclectic (included everything you can think of); curr. type also included every-thing; staff composed of pro. and parapro.; adult:child ratio= Gp. I, 1:1; Gp. II, 1:3; Gp. III, 1:4,5; in-service staff trng.; job service also provided	Perf. based, normative, and affective goals; repeated meas. used; reliability confirmed; data collected by perf. crit. and interviews; other sources -anecdotal; no external eval.; perf. to date indicates success; very expensive to operate	Report written in 1971; material significantly complete but hard to get; no replication; some basic research has been done, but materials not designed for export
The Children's Hospital Proj.; by Huntington in Washington, D.C.; 1-yr. program; begun in 1967; funded by NIMH	Child Variables: 0-3 yr. old children; potentially MR; Black, Greek, Chin., and White; lower class; both sexes; some were medical "high risk" Family Factors: all families high risk (disorg.); low income level	Large urban setting; agency-based prog.; program content asses. in broadest sense by Bayley and emotion; individual prescription written for each child; curr. local; staff composed of pro. and parapro.; teacher behavior unspecified (to be professional); constant supervision, pre-program, and in-service staff trng.; staff ratio=2.7; dental service, jobs, and housing asstce. also provided	Normative and affective goals; research design=no random assignment; sample size=125; control gp. =55; repeated meas. used; reliability confirmed (Bayley); data collected by observation and by stand. tests; other sources=observation of mother, perf. crit., and interviews; monitoring measure= live observation; cost=$5000 per family	Material is available but needs more work; training material= OCD Series on Infants, Film Lists; limited consulting was done

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
Preschool Ameliorative Program; by Karnes in Illinois; 2.25 hours daily for 7-8 months; begun in 1965; funded by OE	Child Variables: 3-4 yr. old, lower class children; 2/3 Black, 1/3 White; half males, half females Family Factors: poor, economically deprived; parents educationally deprived	Small city setting (100,000); agency-based prog.; parent not involved directly 1st yr. but some mothers became teachers in 3rd yr. of proj.; prog. included acad. (basic concepts, spec. lrng. tasks, and number conc.), lang. (verbalization), motor trng., and social skill trng. (several children from higher SES were recruited to achieve integration); curr. based on ITPA struc.; 3 teachers per class (1st yr. teachers, 2nd yr. mothers and teenagers); teacher beh. cogn. open; each teach. met 3 parapro. daily to eval. day's work and plan next day; also teacher rated parapro. 3 times/yr. and discus. eval. with them	Normative goals; sample size=50 (divided into 3 classes taught by: 1) pro., 2) parapro. adults, 3) parapro. teenagers); data collected by stand. tests (Binet, Ill. Test of Psy. Abilities, Frostig Dev. Test, Metropolitan Readiness Test); external eval.; results: equal IQ gains in all 3 classes (12-14 points)	Report written in 1970; material available and complete; mostly inexpensive books were used as instructional material; technical asstce. recd.; eval. materials available
Academic Preschool Program; by Bereiter and Engleman, in Ill. begun in 1964; funded by USOE Coop. Res. Prog.	Child Variables: 4-6 yr. olds	Agency-based prog.; parent not involved; prog. content Piag. Cogn., curr. type Bereiter-Engleman; staff composed of pro.; (Cont'd.)	Normative goals; data collected by stand. tests; cost=$360 per year for materials to be used with 10 children	Now replicated through Becker-Engleman Follow-Through Program; training material available; technical asstce. recd.; manage- (Cont'd.)

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
		adult:child ratio=1:5; teacher beh. op. con.; supervision, pre-program, and in-service staff training		ment system estab.; eval. materials avail. (Becker-Engleman); also curr. materials available
Center for Early Dev. and Education; by Caldwell, in Little Rock, Arkansas; 3-yr. program; begun in 1969; funded by HEW-OCD	Child Variables: 0-6 yr. old Black and White children of both sexes; potentially MR	Large urban setting; agency-based program; prog. content included lang. and motor trng. ("stimulating environment"); curr. type Piag. and local (Interviewer labels program: progressive education model enhanced by concepts from Piaget which provide structure in terms of specific task learning); staff composed of pro. and para-pro.; adult:child ratio=1:4,6; teacher behavior=op. con.* and cogn. open (* Prog. is investigating limits of this tech.; prin. invest. reports many questions about its utility.)	Perf. based, normative (IQ), and affective goals; sample size: infants=12, toddler=15, 3-5 yr. olds=40; repeated meas. used; reliability confirmed; appro. stat. anal.; data collected by observation, stand. tests, and perf. crit.; performance to date indicates success	Report written in 1972; material available but incomplete; some eval. materials available

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
The Florida Parent Ed.: Early Childhood Stimulation Parent Educa. Program; by Gordon, in Florida; 3-yr. program; begun in 1966; funded by Ford Founda., Children's Bur., and NIMH	Child Variables: 0-3 yr. old children (tested until age 6); Black and White; lower class; physically normal Family Factors: 50% single; 50% married; average number of people in home=5.8; density =1.0 per room; low income (inability to pay hospital expenses); age of mother =13 to 39; education of mother (average) =10.4 years	Rural and small city settings; both home- and agency-based; parent involved as client, worker, and teacher of own child; program content included lang., Piag. cogn., and affective component; curr. type Piag. and local; staff included both pro. and parapro.; adult: child ratio=2:5; teacher behavior cogn. open; supervision, pre-program, and in-service training; staff ratio=1:9	Perf. based, normative, and affective goals; posttest-only control group design; sample sizes: E1=150, C1=26; C2=30; attrition rate: E1=-60, C1=-5, C2=0; appro. stat. anal. (anova); data collected by observation, stand. tests, and perf. crit.; other sources=observa. of mother, stand. test, and interview; unplanned social outcomes=degree of change of residence, no. of births, direction of move; no external eval.; monitoring meas.=live observa.; perf. to date indicates success (sustained at age 4); cost=$400/yr./family	Report written 1971-72; material available and complete (training, curr., and eval. materials); technical asstce. recd., management system established (Follow-Through); curr. materials published
The Florida Parent Ed.: Instruc. Strategies in Infant Stimulation; by Gordon and Jester, in Florida; 1-yr. program; begun (Cont'd.)	Child Variables: 0-3 yr. old Black and White, lower class children of both sexes; physically normal Family Factors: -income level OEO	Rural and small city settings; home-based program; parent involved as teacher of own child; prog. content included lang., Piag.cogn., and affective component; curr. type Piag.; staff composed (Cont'd.)	Perf. based, normative, and affective goals; posttest only control group design; sample sizes: experimental group=128, control group=40; attrition data reported; appro. stat. anal. (anova); data collected by (Cont'd.)	Report written in 1972; material available and complete; training material (video tape); curr. materials and eval. materials; some technical asstce. recd.

PROGRAM	TARGET POPULATION	PROGRAM CHARACTERISTICS	RESEARCH AND EVAL. CHARACTERISTICS	READINESS FOR DISSEMINATION
in 1970; funded by NIMH		of pro. and parapro.; teacher behavior cogn. open; supervision, pre-program, and in-service staff trng.; staff ratio=1:4; nutrition and health services also offered	observation, stand. tests, and perf. crit.; other sources=observa. of mother and perf. crit.; no external eval.; monitoring meas. =live observa., perf. crit., and video tapes; performance to date indicates some differ. between pro. and parapro. by sex of child	
The Florida Parent Ed.: Follow-Through and Head Start; by Gordon, in Florida; 3-yr. program, begun in 1968; funded by OE (OEO), OCD	Child Variables: 4 yrs. and older, Black, White, Chicano and Indian, lower class and middle class; both sexes Family Factors: poverty group is primary, but 1/3 is middle class	Rural, small city, and large urban settings; both home- and agency-based programs; parent involved as client, worker, decision-maker, and teacher of own child; prog. content included acad., lang., and Piag. cogn.; curr. type Piag. and local; staff composed of pro. and parapro. (1:2); adult:child ratio= 1:10; teacher beh. local (recommend experimental, cogn. open); supervision, pre-prog., and in-service staff training; nutrition, health, social, and psychiatric services also provided	Perf. based, normative, and affective goals; sample size: 9000 families in 10 states; data collected by observation and stand. tests; other sources= observation of family, perf. crit., and interviews; external evaluation by SRI; monitoring measures= live observation and video tape; performance to date indicates success	Report written in 1972; partial material available; is replicable; training material and local curriculum materials available; tech. asstce. recd.; management system estab.; some evaluation materials available; set of local criteria established

Appendix C

Personal Contact Interview Schedule/Report Outline

Clarify and complete the information contained in the 20 Questions form and dossier and in addition cover the following areas:

1. Scale and scope of your program
   Numbers and kinds of children served in past? Types of children served best? Changes planned in future? Can program fit other "types" of children? How heterogeneous can your target-consumers be? Model completed away from development site? Where? With whom?

2. Summative and comparative evaluations of your program
   How adequate and meaningful is your selected comparison group? Comparisons of spin-off programs with original parent model? What is your reference/criterion group in terms of national/local norms?

3. Formative evaluation of your program
   Program focus? Program theory or philosophy? How do teacher behaviors reflect focus and philosophy? Behavioral objectives for teachers and students? Monitoring, evaluating, record keeping systems?

4. Difficulties in conduct of intervention research
   Sampling? Community acceptance? Accountability? Parental contract or involvement? Expense in building comprehensive model? Treatment drift? Adequacy of evaluation? Follow-up? Uses and abuses of statistics?

5. Costs
   Per pupil expenses? Financial history and future of program? Start-up vs. continuation costs? Ability to relate costs to treatment effects?

6. Expected benefit to society in general
   Reductions on future expenditures for institutionalization, welfare, or continuing special educational programs in public schools? Can these projected benefits be quantified?

7. Time parameters of intervention programs
   What is optimal time programs should begin in order to maximize long-term gains for parents and children?
   How frequently per week and how long should intervention continue to maximize program effects?

Personal Contact Interview Schedule/Report Outline

8. Following-up program effects
What aspects of children and parents served should be subjected to evaluation following end of involvement in program? Where in "cycle of poverty" should change occur? Sleeper-effects?

9. Breadth of program impact on community systems
Employment of women? Coordination of and cooperation among community service agencies? Attitudes toward low-income individuals? Extent to which local area becomes dependent on continuation of federal funds? Effects on public elementary and secondary school policies?

10. National implementation of early educational programs
Would you recommend your and/or any of the "best" programs you nominated for implementation on a national scale? Why? Why not? Completeness of your and/or others' curriculum and materials? Would any of these be your choice for an early educational model to be implemented on a compulsory basis?
What about compulsory preschool education in general?

11. Intervention mechanisms of government
Examples of positive and negative governmental responses (policies, programs) to high-risk, potentially mentally retarded children and their families? What needs to be done and at what levels?

Twenty (or so) Pertinent Questions on Early Childhood Intervention

We are looking for a summary of your thinking in straightforward terms. In responding with brief phrases please attempt to list your responses in order of importance. The number of lines for each question was somewhat arbitrarily assigned so don't hesitate to respond with fewer or more items than indicated. If you would like to respond differentially in terms of separate programs in which you are involved (infant, toddler, preschool, early elementary) or in terms of program location (at the R & D site or in the field), please use the reverse side of a page.

1. Which aspects of your early childhood program(s) do you consider essential (i.e., those minimal program characteristics without which you would not achieve your program goals)?

1. _____

2. _____

3. _____

4. _____

5. _____

2. Based on your experience in implementing your program(s) over the years to improve the functioning of children and parents, which alterations of your original "game plan" do you consider most important?

1. _____

2. _____

3. _____

4. _____

5. _____

3. What do you consider to be the key (and often underemphasized) problems and issues in maintaining early childhood intervention programs at a high level of quality on a day-to-day basis?

1. _____

2. _____

3. _____

(Remember, list in order of importance)

4. In terms of program content or approach, what do you consider to be your major gaps or weaknesses?

1. _____

2. _____

3. _____

5. Indicate desired characteristics and qualifications of staff members to implement your program(s).

1. _____

2. _____

3. _____

6. How would you characterize the essentials of training staff to implement your program(s)?

1. _____

2. _____

3. _____

7. Which key teacher behavior outcomes necessary for implementing your program(s) do you find most difficult to achieve and why?

1. _____ _____

_____

2. _____ _____

_____

3. _____ _____

_____

8a. Which child-outcome objectives do you find most difficult to achieve and why?

1. _____ _____

_____

2. _____ _____

_____

3. _____ _____

_____

4. _____ _____

_____

5. _____ _____

_____

8b. Which child-outcome objectives do you find most difficult to achieve and why?

1. _____ _____

_____

2. _____ _____

_____

3. _____ _____

_____

4. _____ _____

_____

5. _____ _____

9a. Which parent-outcome objectives do you find most difficult to achieve and why?

1. _____ _____

_____

2. _____ _____

_____

3. _____ _____

_____

9b. Which parent-outcome objectives do you find most difficult to measure and why?

1. _____ _____

_____

2. _____ _____

_____

3. _____ _____

_____

10. How would you characterize the functions of parents in your program(s)?

1. _____

2. _____

3. _____

4. _____

5. _____

11. Characterize the type(s) of children and families with which your program has most difficulty.

1. _____

2. _____

3. _____

12. List the strengths of your approach to program evaluation (e.g., design, tools, cost, subject attrition, control over external variables, etc.).

1. _____

2. _____

3. _____

4. _____

5. _____

13. List the weaknesses of your approach to program evaluation (e.g., design, tools, cost, subject attrition, control over external variables, etc.).

1. _____

2. _____

3. _____

4. _____

5. _____

14. In your opinion, which are the three best preschool programs for potentially retarded or high risk children? Why?

1. _____ _____

_____

2. _____ _____

_____

3. _____ _____

_____

15. In your opinion, what are the most <u>overrated</u> preschool programs for potentially retarded or high risk children and why?

1. _____ _____

_____

2. _____ _____

_____

3. _____ _____

_____

16. In your opinion, which are the three best infant and toddler programs for potentially retarded or high risk children? Why?

1. _____ _____

_____

2. _____ _____

_____

3. _____ _____

_____

17. In your opinion, what are the three most overrated infant and toddler programs for potentially retarded or high risk children? Why?

1. _____ _____

_____

2. _____ _____

_____

3. _____ _____

_____

18. What are your major program accomplishments, developments, and achievements which would enable you to export your program on a nation-wide scale (e.g., formal curriculum, teacher training techniques, record keeping systems, etc.)?

1. _____

2. _____

3. _____

4. _____

5. _____

19. What are the major gaps in your program(s) which would hinder nationwide implementation?

1. _____

2. _____

3. _____

4. _____

5. _____

20. What do you consider to be the key problems in implementing an early education program at a distance from the parent research and development organization?

1. _____

2. _____

3. _____

4. _____

21. What do you consider to be the major gaps in research knowledge in the area of early childhood intervention?

1. _____

2. _____

3. _____

4. _____

5. _____

22. If funds were available, what are some high priority areas of investigation you would undertake in the future?

1. _____

2. _____

3. _____

23. From the standpoint of research and development, what would be the essential elements of an exemplary HEW approach to early childhood intervention concerned with the problems of potentially retarded, low-income, and high risk children and their parents?

1. _____

2. _____

3. _____

4. _____

5. _____

24. Please rank the following 15 research needs (from Grotberg, et al., 1971) in the order of research priority which you would recommend for government funding, from most (1) to least (15) critical.

_____ A few evaluations are now examining the impact of various sequences of intervention experiences. We need further evaluation along this line.

_____ There is need to evaluate and compare both on a short- and long-term basis, the impact on parents and children of various components and combinations of components of intervention studies, such as medical services, social services, counseling and psychotherapy, and parent and child education as well as home vs. center programs.

_____ There is need to explore the long-term effects of environmental manipulations as well as interventions with the children.

_____ There is need to examine the long-term effects of peer group values, attitudes and behavior on young children.

_____ There is need to explore further methods of changing parental attitudes and behavior including group dynamics methods.

_____ We need to more fully evaluate the short- and long-term effects of parent participation in program decision-making on program content and operations, staff, and children, as well as on the parents who do or do not participate.

_____ There is an increase in the range and types of impact being measured. For example, in addition to changes in I.Q. and achievement, changes in various learning styles and social-emotional characteristics are being examined. This trend needs to be continued.

_____ There is need to examine further the impact of preschool intervention programs on immediate and long-range family relationships, including parents and siblings.

_____ Indirect effects of intervention programs, such as effects on neighborhood children and younger siblings who did not directly receive program services, have been found in a few studies. More studies need to examine for such effects.

_____ There is need to consider individual differences in intervention program, development and assessment.

_____ We need to look further at patterns of results on various measures in addition to looking at results on individual measures.

_____ There is need to analyze contingencies between environmental events and behavior both in natural settings and in intervention programs.

_____ There is need to look for, evaluate, document unintended positive as well as potentially harmful effects of intervention programs on young children and their families.

_____There is need for increased cooperation and coordination in funding and evaluating various intervention programs.

_____ There is a need to further consider the relationship between program development and program evaluation. How can we provide opportunities for modifying programs while they are in operation and provide time for full implementation of the program while at the same time making reliable, valid assessments of program impact? Current efforts to resolve this issue include delaying evaluation for a number of years and including as a part of program evaluation a close examination of the program procedures actually in effect.

Appendix D

The Milwaukee Project

Of all the visible, well designed, innovative apparently successful intervention research projects, the Milwaukee project, directed by Dr. Rick Heber at the University of Wisconsin, bears special attention.

Basically a research project, not a demonstration and planned export program, the thrust of Heber's activity is to attempt to prevent, through an infant education-intervention program, the development of intellectual deficiency in infants from homes with specific environmental characteristics (e.g., level of maternal and paternal tested intelligence and the correspondence of both parents' IQ scores; number of siblings in family) which have been demonstrated to be strong predictors of subsequent retarded development. From a slum area in Milwaukee, 40 mothers with newborn infants whose own IQ was 70 or less were randomly assigned to either an experimental or control group. Intervention began soon after the experimental mother returned from the hospital with her newborn infant. This in-home phase attempted to create mutual feelings of trust and respect between the mother and the infant teacher. When each infant reached approximately 4 months of age it was transported to and from the infant education center located in the high risk neighborhood itself, by the infant teacher. The center program, lasting 8 hours daily, consists of an intensive and highly structured program of sensory and language stimulation. Major program goals for infants are to facilitate achievement motivation, problem solving skills, and language development. Repeated measures are made of the experimental infants on standardized developmental-intelligence tests (Cattell and Binet), dimensional

preference strategies, perseveration tests, free speech samples, and formal language tests.

A second intervention effort is the Maternal Rehabilitation Program. In this program the 20 low IQ mothers of the experimental infants are offered on-the-job occupational training, as well as training in home management and child care skills. All other children of these mothers are cared for in day care programs to make vocational rehabilitation a viable possibility.

As experimental newborn infants were phased into the center program, analyses were run on an older and a younger experimental group and appropriate aged controls. Younger and older experimental infants surpass control infants on most measures. The most striking differences are evidenced on measures of language performance, with experimental infants superior in vocabulary production, sentence repetition, and grammatical comprehension. At 42 months of age the average discrepancy between the experimental and control group children on tested intelligence was 33 IQ points. These findings are preliminary as the longitudinal project has not yet terminated.

A summary of the findings so far in the project may be broken down into 5 main areas: (1) intellectual development up to age 22 months, (2) measured intelligence up to 54 months, (3) learning and performance tasks, (4) social-personality development, and (5) language development.

1. Intellectual development to age 22 months - Up to 14 months of age, the control and experimental groups are comparable on all 4 Geselle scales (motor, adaptive, personal-social, and language). At 18 months of age, the control group falls 3 to 4 months below the experimental group on the motor, adaptive, and language scales. At 22 months, the experimental group scores between 4.6 and 6.1 months above the control groups on all scales. The

controls fall below the Gesselle norms on the adaptive and language scales (1.2 months and 1.9 months respectively).

2. Measured intelligence to 54 months - Measures included the Cattell Scale, extending into the Stanford-Binet. The Wechsler Preschool and Primary Scale of Intelligence was given at 51 months. Differences in IQ during 24 to 54 months are evidenced in an experimental group mean IQ of 122.6 and a control group mean IQ of 95.2. The minimum difference between the groups at 27 months was 24 IQ points, the maximum difference at 42 months was 30.1 IQ points. After 22 months, intellectual development of the experimental group remains fairly constant. After 22 months the control group shows a declining trend. There are interesting differences in variance within the two groups. The experimental group showing less variance.

3. Learning and performance tasks - Of greatest interest in this area is the indication that the experimental groups demonstrated age appropriate conservation of number behaviors while controls, neither younger nor older infants, failed to show a conservation prototype (performance to a criterion of five out of ten trials). Similarly, conservation of quantity, as well as number, was demonstrated in experimentals but not in controls.

4. Social-personality development - The experimental infants demonstrated a larger number of positive aggressive behaviors than control infants in the intervention program. More aggressive acts were observed among experimentals than among controls. In the area of mother-child interaction and the development of cognitive style, more information was observed being transmitted between experimental mother-child dyads than between control dyads. Experimental group dyads engaged in more verbal interchange and less physical interchange than control dyads.

5. Language development - Experimental group children demonstrated superiority in production, imitation, and comprehension. At 4 years of age experimental group children were one year advanced over control group children in sentence repetition and at approximately one and one-half years ahead of controls on comprehension abilities. Experimental group children at age 4 years 8 months demonstrated mean language age scores of one and a half years greater than the control group children on the Illinois Test of Psycholinguistic Abilities.

While obviously successful as a research activity, the project is a long way from exportable at this time. There are neither the resources nor the staff to engage in export until such time as the research question is settled clearly.

Appendix E

I. Reviews of Programs and Related Papers

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Sparling, J. J., & Gallagher, J. J. Research directions for the 70's in child development. University of North Carolina, Chapel Hill: Frank Porter Graham Child Development Center, 1971.

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IV. Addendum

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